A Report of the Ontario Council of Health,
senior advisory body to the
Minister of Health.

## 1983

# MEDICAL MANPOWER FOR ONTARIO

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# PART I

## Report of Ontario Council of Health

# Part I

# OCH Report to the Minister of Health on Medical Manpower

May 1983

## Chapter 1

# Introduction

The Ontario Council of Health, at the request of the Honourable Dennis Timbrell, Minister of Health, embarked on a study of medical manpower in Ontario in the summer of 1981.

In his letter of June 25, 1981, the Minister emphasized his primary need was for advice regarding the numbers of postgraduate students in Ontario's five University-directed training programs. However he went on to state "Council should feel free to explore and comment on all issues relevant to manpower planning".

Council created a special Medical Manpower Task Force (MMTF) to aid it in developing its advice to the Minister, and designed its terms of reference to reflect the Minister's specific concern and his invitation to address other issues having to do with medical manpower.

It was felt that the ideal way to deal with medical manpower issues was to examine them first in the context of the health care system as a whole, and only then to develop a policy to meet medical manpower requirements within that context.

But because Council recognized that the Minister's most pressing need was for advice on the postgraduate training establishment, it asked the Task Force to deal with its task in reverse order, looking at the narrower issue first (Phase I) and only later examining medical manpower in the broader context (Phase II). The terms of reference for the Task Force are set out on page 6 of this report.

The Task Force set a brisk pace to meet the Minister's time deadlines. It consulted with those concerned with medical manpower issues by inviting briefs and oral presentations. It consulted with experts in the field of medical manpower forecasting and planning, and it examined much data. It commissioned a study by a consulting firm, to forecast physician supply and demand in Ontario to the year 2001 through the use of a simulation model (See Appendix I).

To aid itself in dealing with its Task Force's reports (Phase I & II), Council obtained critical reviews of the reports from a number of experts in the field who had no direct interest in Ontario's health policy.

Council studied the Task Force reports with great care, took into consideration the comments of the external reviewers, and accepted the report, as a basis for its own consideration of the issue and its advice to the Minister on this matter.

Council's discussion on the issue is set out in Part I, Chapter 2.

## Terms of Reference for the Task Force project

The Ontario Council of Health has been asked to advise on medical manpower requirements for Ontario, including related educational considerations.

In arriving at sound conclusions on these issues, Council must have an understanding of the relevant basic factors on which to identify options and to make judgements in respect to both near term and long term policy. In general, these relate to both the *content* of the information and to the *context* within which it is used.

More specifically the *context* factors would include:

1. Some consideration of the political and policy environment in which the study results would operate. For example, what are the likely external social values and economic conditions Ontario is likely to be facing, say in 1990—eight years from now, as well as the internal values and arrangements expected in the health and medical care system.

2. The relationship of the medical manpower pool to such things as adequacy of medical services on the one hand, and cost on the other.

3. The role of incentives for cost-effectiveness and cost-benefit. The linkage between program and service decisions and responsibility for generating support funding.

4. The impact on medical services and costs of different modes of service delivery.

5. The effects of "physician extenders".

6. The effects of new technology.

The content aspects of the study include factors, ranges, trends, impact, and reliability of data regarding such things as:

1. Population projections—numbers, age groups, ethnic make-up.

2. Physicians—age and sex distribution, attrition rates.

3. Physicians—population ratios—the bases for them, comparison with other jurisdictions, relationship between ratios and various health and disease indices.

4. Women in practice.

5. Physician productivity.

6. Immigration/emigration/interprovincial migration.

7. Canadians studying outside Canada.

8. Education and licensing—health and content of programs, length of prelicensure training, sources and amounts of funding support.

9. Role of postgraduate trainees in hospital service, in teaching of undergraduates in medicine, and other health disciplines.

Because of the very broad scope of the manpower issue, and its intimate relationship with the larger issues of health and sickness, and the growing costs of health related programs, the Task Force is asked to accept two interrelated assignments, one short-term and one long-term. The answers required in the short-term are those most closely related to the content of the issue, but should be sought keeping in mind the longer-term context-related considerations.

The terms of reference for the short-term study are to:

1. Identify and assess the significant factors bearing on Ontario's requirements for medical manpower through the 80's.
2. Project probable physician/population supply ratios to 1990 assuming no change in government policies or regulations.
3. Assess the relationship between current establishment of interns and residents and projected supply of physicians.
4. Develop recommendations concerning policy for postgraduate training including numbers of Ministry of Health-funded interns and residents for 1983–84, 1984–85 and 1985–86.
5. Submit a report to the Ontario Council of Health by February 1, 1982.

The terms of reference for the long-term study are to:

1. Recommend appropriate objectives for medical manpower policy taking into consideration the Government's purpose in controlling the form and rate of economic growth in the 1980's and its objective of cost-effective evolution of the health system.
2. Identify policy options for achieving and maintaining the recommended objectives.
3. Recommend appropriate policy options and appropriate methods of implementation.
4. Report to the Ontario Council of Health by February 1, 1983.

## Chapter 2

# Discussion: Medical Manpower (Ontario) 1983

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The first phase of the Task Force's activities dealt with the postgraduate training establishment, a very limited component of medical manpower policy. It was completed on time in February 1982, approved by Council, sent to the Minister, and dealt with by him in the ensuing months. The Phase I study is set out in Part III.

The Phase II report deals primarily with the issue of medical manpower in general, although it gives some further consideration to the matter of postgraduate numbers in the context of the broader aspects of medical manpower.

Council's discussion is structured to answer as directly as possible the three key terms of reference given to the Task Force for its Phase II study. These are:

1. *To recommend appropriate objectives for Medical Manpower Policy—taking into consideration the Government's purpose in controlling the form and rate of economic growth in the 1980's and its objective of cost-effective evolution of the health system.*

2. *To identify policy options for achieving and maintaining the recommended objectives.*

3. *To recommend appropriate options and appropriate methods of implementation.*

Before dealing with the terms of reference, some comments on medical manpower planning in general help to explain the predicaments of any who might venture into this endeavour.

Bloom and Peterson in 1979, reviewed all the published medical manpower studies in the United States over the past forty years[1] and found them flawed in the following ways:

1. Recommendations were not based on relevant data obtained by well-designed studies. They pointed out that even if good data were collected, they did not always assure appropriate recommendations.

2. The biases of those conducting the studies were reflected in the recommendations. For example most manpower investigations were conducted by academic clinicians whose views may have been shaped by their perception of needs for the system.

3. The competence of those conducting the studies compromised the outcomes. Frequently, physicians with little experience in the type of population studies required have conducted the investigations.

As a consequence of these potential weaknesses, particular care was taken to ensure that the membership of the Task Force reflected a balance of skills and knowledge, and that the biases of any individual member would not dominate the group.

In addition, before it began its work, the Task Force invited Professor Bloom to advise on methodology and help avoid the pitfalls that others had encountered. Once the Phase II report was completed, it was sent to Professor Bloom for his comments. The introduction to his review contained some general observations on medical manpower planning as follows:

> "Estimating the number of physicians required to serve any substantial population is one of the most difficult and frustrating exercises in policy planning. There are so many exogenous and endogenous variables over which policy makers have little control that the entire process often becomes an exercise in futility. The independent nature of practice, the physician's ability to exert an important measure of control over both patient demand for services as well as allocation of resources to supply services, the general lack of information by the public on need, quality and price, rapidly evolving modes of care and treatment, impressive technological changes, the inability to substitute capital for labor, the long lead-time required to modify numbers and types of practicing physicians and a host of others all speak to the difficulty of determining physician requirements. The vast majority of physicians practicing today will still be practicing in the year 2001. The large number of physicians currently in training will be coming on-stream in the next few years and will also in the main be practicing in 2001. The inability to change existing manpower numbers and the relatively short period until 2001, only 17 years from now, only add to the difficulty of rational physician manpower policy planning. Thus, any group dealing with the problem of physician numbers must view their own final product with a certain amount of skepticism. Their results cannot be accepted as fact, but rather should be accepted as a broad set of parameters and their recommendations as but one set of alternatives.
>
> Lastly, manpower planning cannot be viewed in isolation. It must be developed within the context of the broader health and medical care planning goals and objectives. What direction will practice organization take over the next two decades? Will there be greater impetus for Community Health Centres and HSOs? Will provincial and federal health budgets remain at their current level of relationship to gross national product or gross provincial product? Will there be an increased emphasis on care provided by specifically trained nonphysicians such as nurse practitioners, nurse anesthetists, physician assistants and the like?
>
> I think the Ontario Ministry of Health must review the Task Force Final Report within this broader context or they will fail in their policy making efforts much as we have in the United States, by being enamored with the numbers and not with the general direction that results point toward, i.e., which is that based upon a set of predetermined goals and objectives."

**Term of Reference #1**

*To Recommend Appropriate Objectives for Medical Manpower Policy—taking into consideration the Government's purpose in controlling the form and rate of economic growth in the 1980's and its objective of cost-effective evolution of the health system.*

Council can see only one overall objective for medical manpower policy, and that is to serve the needs of the health care system presently in place or as amended from time to time.

Medical manpower policy should serve the system, not the other way around. There should be an identification of what the system is expected to achieve, and then of the resources required to meet the goals of the system. Resources refer to programs, facilities and personnel of all types.

This approach implies a long-range perspective and necessitates an examination of a) trends affecting the present system, and b) models of the various systems that might possibly be in place, five, ten or twenty years hence.

This approach is congruent with the thrust of the Honourable Larry Grossman, the present Minister of Health who has expressed his concern "that we have not yet developed an overall health care strategy in this province. All too often our approach to health care depends on reacting to crises and initiating policies and programs on an ad hoc basis."[2]

An obvious first step in this approach is to project an extension of the *present* system (the one we know most about) and to identify requirements given *that* scenario. This approach, in addition, would provide a reasonable base line for comparison with projections of requirements for other scenarios.

When it was about to embark on Phase II of its study, the Task Force asked for and received direction from Council regarding a choice between two alternative approaches. The first was to identify manpower requirements for a number of theoretical scenarios involving alternative roles for nurses and other health workers, alternative modes of delivery of care, and alternative payment policies for physicians.

The second approach was to identify medical manpower needs in Ontario for the year 2000 assuming continuance of the arrangements in the existing system, whatever its strengths and weaknesses.

Council directed the Task Force to choose the latter approach, given the pressures of time, limited resources, and the impracticality of predicting medical manpower requirements for a reformed health care system not yet defined for Ontario.

Council made this suggestion in the full realization that fundamental changes in the health care system might well occur over the next seventeen or eighteen years. Council is aware that the present system is considered less than ideal in terms of efficiency, effectiveness, cost, resource allocation and equity of access. It is conscious that the winds of change are blowing. However, Council felt it would be an exercise in futility to speculate on all the possible outcomes, and look for medical manpower requirements to support each one.

Council therefore believes that an appropriate OBJECTIVE FOR MEDICAL MANPOWER POLICY is *that it should serve the health care system as it exists at present and that manpower policies should change to conform with overall provincial health policy as it evolves and is put into operation.*

Council must not leave this term of reference without commenting on its second part—the Government's purpose in controlling the form and rate of economic growth in the 1980's and its objective of cost-effective evolution of the health system.

Council is aware that the Ontario Government is committed to control economic growth and to cost-effective evolution of the health system and supports those efforts. It is aware also that the numbers, types and distribution of practising doctors, their mode of practice and methods of remuneration all have a bearing on these matters.

Whatever the issues which are causing pressures for growth or challenging cost-effective evolution of the system, Council believes that to try and control the hemorrhage by some limits on medical manpower, without first looking at the whole system, is like putting a band-aid on a cut finger, when the serious loss of blood is from a complex internal condition.

To that extent then, the Task Force report makes no pretense at being the last word in medical manpower planning in Ontario. Council sees it as simply a logical step in a series of policy steps that must be undertaken.

### Term of Reference #2

*To identify policy options for achieving and maintaining the recommended objectives.*

Since the objective recommended by Council would make medical manpower policy subservient to larger overriding health policies, manpower policy options would be dependent on the nature of the overall policies, and the timing and method of their implementation. Therefore *one option* clearly sets medical manpower policy within the context of a new long-range strategy for health as it is developed over time, or within the present system to the extent that it remains in place. Since all we have, or can clearly see in the near term, is the present system, this option would require examining the nature of the present system and the medical manpower requirements that flow from it. This is the option followed by the Task Force.

A *second option* for meeting the medical manpower policy objective would be to use medical manpower policy to manipulate the system. The effective use of this option would necessitate an explicit and quantitative indication of problems in the system which needed correction, and then the use of medical manpower policy as the tool.

For example, claims such as "costs are running out of control" are vague and useless as a basis for an isolated and uncoordinated approach to medical manpower policy.

Costs of the system are the sum of many complex interrelated factors, of which the number of doctors is but one component.

If Government, despite these arguments, wishes to use the second option, the Task Force Report (Paras 117–122) outlines some of the things that would have to be done if it wanted controls on numbers of doctors practising in Ontario, each in the absence of a "Health Strategy for Ontario".

In summary, Council identifies two policy options for achieving and maintaining the recommended medical manpower policy objective:

1. to identify medical manpower requirements as an integral part of an overall plan for medical care which in turn is determined by a broad long-term health strategy for Ontario;

2. to use medical manpower policy as a tool to manipulate the system, once the goals and objectives of the system have been clearly articulated.

**Term of Reference #3**

*To recommend appropriate options and appropriate methods of implementation.*

It is the opinion of Council that the first two terms of reference cannot be implemented in any rational way in the absence of an explicit health strategy for Ontario. It seems premature to recommend on the MEANS TO THE ENDS when the ENDS have not been determined.

The Task Force has indicated that by the year 2000, given an aging population, physicians working fewer hours, and other factors, a shortage of physicians could result if current levels of medical manpower are not maintained.

A reduction in numbers relative to population could be tolerated, and quality and equity preserved only if government moves to alter the system such that the provision of physicians' services become more efficient and effective. Although little quantitative data are available as yet to back these claims, there are suggestions that changes in delivery systems, increased use of auxiliary health care personnel, appropriate use of new technologies, and increased emphasis on disease prevention and health promotion activities may lower the requirements for medical manpower in the future. Council cannot predict the extent of the effectiveness of these strategies on costs or other considerations, but it supports and encourages further research, pilot projects and policy development in these directions.

Another suggestion which would allow a reduction in physician numbers while preserving quality of care and equity is to reduce the amount of inappropriate or unnecessary physician-generated and patient-generated utilization of health services. Council recognizes that the potential for overutilization of medical services exists but it is very difficult to assess the extent of the problem. Academics, government and physicians each have different definitions of whether medical services are overutilized and physician-generated and patient-generated demand cannot be differentiated in the major sources of data for Ontario.

The Task Force initially asked the consulting firm to design a need-based study to be applied to the Ontario situation but this was found not to be feasible given the limited resources, state of the art and time available to the Task Force.

In recognition of the possibility that medical services are overutilized and in the absence of a satisfactory estimate of the extent of this overutilization, Council supports the need for futher research in this area and incentives for both providers and consumers of medical care to use the system appropriately.

Council feels that the next step in the direction of an effective medical manpower policy is to examine options beyond the health care system as it is presently organized and operating. This would require specification of the particular organizational options within which medical manpower would function.

The Minister, committed to the development of a long-range strategy for health for Ontario, asked Council to convene a Health Policy Conference in April 1983, to identify possible future directions for the 1980's and beyond.

Out of this it is expected that action will begin to occur on a variety of issues, many of which will have implications for medical manpower.

Council therefore takes the position that Government should identify and examine several different health care delivery arrangements with a view to determining which offers the optimal balance of efficiency and effectiveness. Such examinations should incorporate the medical manpower requirements for each arrangement.

While the emphasis of the Task Force report is within the context of the health system in Ontario, this province is an integral part of a larger community. Many aspects of medical manpower policy, depend on nationwide agreement and coordination for effective implementation, particularly with respect to immigration policies, the size of medical schools and postgraduate training establishments.

## Chapter 3
# Recommendations

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**Council recommends:**

1. that the objective for medical manpower policy be to serve the health care system as it presently exists, and that manpower policies should change to conform with overall provincial health policy as it evolves and is put into operation.

2. that the above objective be achieved by identifying medical manpower requirements as one aspect of an overall plan for medical care, which in turn is determined by a broad long-term health strategy for Ontario.

3. that medical manpower policy be used to steer the system only when the goals and objectives of the system have been clearly articulated.

4. that Government identify and examine several policy options for different health care delivery arrangements with a view to determining which offers the optimal balance of efficiency and effectiveness, and that medical manpower requirements be identified for each option.

5. that Government accept the recommendations of the Task Force on Medical Manpower Phase II, as a basis for near term management decisions, and for the ongoing process of health manpower and policy development.

6. that an effective capability be developed to examine medical manpower issues on a national basis, so that provinces are enabled to design policy which is implementable within a national context.

# References

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1. Bloom, Bernard S., and Peterson, Oster L., Physician Manpower Expansionism: A Policy Review. Annals Internal Medicine 90: 249, 1979.

2. Grossman, Hon L., Address to the Association of Young Health Executives. March 13, 1982.

# PART II

# Report of Medical Manpower Task Force, Phase II

# Medical Manpower For Ontario

## *A Policy Perspective*

Final Report of the
Task Force on Medical Manpower
Ontario Council of Health
February 1983

## Chapter 1
# Introduction

Ontarians, for many years, have enjoyed medical care of high quality. Since the report of the Royal Commission on Health Services (1964), the system for financing health care has evolved to its current state where hospitals and other institutions are funded by the Ministry of Health and medical services are insured by the Ontario Health Insurance Plan from which doctors are reimbursed on a negotiated fee-for-service basis. The present arrangements provide Ontario citizens with virtually universal high quality care. Over the years the amount of care, its quality and its cost have risen as more hospitals and other institutions, more and better trained doctors, and new sophisticated technology have become available. In addition the demand by the public for services has increased.

Although the system seems highly valued by the people of Ontario, it is not without its problems. Among them, government's concern about costs ranks high. Expressed in absolute dollars, public expenditures on health reached $4.89 billion in 1980–1, or about 28% of the total expenditures of the Ontario government. Nevertheless, Ontario has been successful in controlling costs. The percent of gross provincial product devoted to health care by the Ministry of Health in 1970–1 was 4.4%; in 1980–1 it was 4.5%.[1]

Although many factors contribute to the cost of health care, a perception developed during the 70's that the number of physicians in practice is particularly important as a determinant of cost. This perception was based on reports appearing in both Canadian[2] and American[3] literature which claimed to show that the amount of medical care provided is related to the number of physicians. In other words, within broad limits, the larger the supply of physicians the larger the demand for and utilization of physicians' services. This interpretation led to an assumption by the Ministry of Health that each physician added to the roster in Ontario resulted in additional costs amounting to $225,000 per annum. Acting on this assumption, the Ontario Government adopted a series of policies intended to limit growth in the number of physicians and specialists in the province. These policies include a 1975 decision to hold the physician/population ratio at 1:585[4], an agreement (with the Federal Government) in 1975 to restrict entry of non-Canadian physicians, and a policy in 1975 to adjust specialty training to meet a target ratio of 55:45 general practitioners to specialists. Despite these policies the physician to population ratio had increased to 1:539 by 1981.* In 1981 a policy to reduce the number of Ministry-funded postgraduate training positions by 17% over a period of 4 years was introduced.

The government's concerns were further heightened in 1980 with the publication of a report by Mr. Justice Emmett Hall which predicted that "if present recruitment into the profession continues, the ratio (in Canada) may well be one physician to 300 citizens by the year 2000."[5]

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*This ratio is based on the number of physicians registered with the College of Physicians and Surgeons and residing in Ontario.

It was in this climate that the Task Force on Medical Manpower was established by the Ontario Council of Health in September 1981 at the request of the Minister of Health. The Task Force was asked to address immediate concerns about the size of the postgraduate establishment (which it did in its Phase I Report) and to address long term issues of medical manpower policy. The terms of reference for the long term study were:

1. To recommend appropriate objectives for medical manpower policy taking into consideration the Government's purpose in controlling the form and rate of economic growth in the 1980's and its objective of cost-effective evolution of the health system.

2. To identify policy options for achieving and maintaining the recommended objectives.

3. To recommend appropriate policy options and appropriate methods of implementation.

The Task Force undertook the following steps in responding to its terms of reference:

1. The Task Force met with a number of individuals with relevant expertise. (Appendix 1.)

2. The Task Force invited some 71 organizations to submit briefs. Twenty-three submissions were received. (Appendix 2.)

3. The Task Force met with representatives of 5 organizations to explore their views. (Appendix 3.)

4. The Task Force engaged Arthur D. Little of Canada Limited to develop supply and demand models.

5. The Task Force engaged research assistants to prepare literature reviews on: a) the relationship between new health care delivery systems and physician productivity; b) physician substitution by allied health personnel; c) service requirements of the elderly; d) new technologies; e) public perceptions and attitudes regarding physician's services.

The report is organized in the following manner. Chapter II sets out the principal issues of medical manpower policy with which this report is concerned. Chapter III examines the supply and demand for physicians' services and projects both to the year 2001 under alternative assumptions. Chapter IV looks at possible modifications to the health care delivery system and assesses the kind of impact they may have on demand for physicians' services. The fifth chapter discusses the issue of geographic distribution of physicians. Chapter VI summarizes briefly the findings of the Task Force in its initial (Phase I) report and assesses its conclusions and recommendations against the findings in the current report. The last chapter presents conclusions and recommendations.

## Chapter 2

# Medical Manpower Issues

The main policy issues concerning medical manpower include: 1) numbers of physicians, 2) distribution of physicians, 3) numbers and kinds of specialists, 4) the ratio of general practitioners to specialists, 5) quality of medical manpower. The terms of reference are silent on the matter of quality of medical manpower; thus it is assumed that this is not a concern. Canada has been blessed with good medical schools and very high standards of medical practice—comparable to the best, world wide. All medical manpower policies in Ontario must reflect commitment to the maintenance of the quality achieved and this commitment is taken as underpinning the assessment of numbers and distribution.

In the Phase I report the ratio of general practitioners to specialists was examined and the current ratio was found to be consistent with the policy objective of the Ontario government, i.e. a ratio of 55% general practitioners to 45% specialists. It was noted that there is no evidence justifying this particular ratio (or any other) but that since the actual ratio coincides with the policy objective and since there is no evidence of difficulties as a result of the status quo there is no cause to offer advice. It was noted, however, that projected output of postgraduate medical education programs in Ontario would lead to a relative increase in the output of specialists and the Council of Faculties of Medicine was advised to re-examine its planned allocation of postgraduate places as it affects the ratio of general practitioners to specialists.

The Task Force is aware of identified shortages in a number of specialties. Although there may not be consensus on the lists, the Minister of Health in his decision to allow increases in numbers in certain fields to offset the planned decrease in total funded postgraduate placements has implicitly recognized shortages in these fields. They include family medicine, community medicine and public health, radiation oncology, psychiatry, anaesthesia, rehabilitation medicine, geriatrics, emergency medicine and neonatology. The view of the Task Force, as expressed in its Phase I Report, is that allocation of places within an appropriate total number of funded positions should be the responsibility of the medical schools through the Council of Faculties of Medicine. The Low Committee has made an excellent beginning by assessing requirements, specialty by specialty, and estimating the size of the postgraduate establishment to produce the targetted numbers.[1] It will be necessary, however, to reassess the numbers within the limits of the total funded positions allowed by the Minister of Health.

This report therefore is limited to the remaining policy issues, i.e. total numbers of physicians and geographical distribution of physicians including distribution of specialists.

Medical manpower can be examined from two alternative perspectives. One way is to use medical manpower as the point of departure and examine its impact on health status, quality of care and costs. Another way is to consider the needs of the public for effective and efficient (economical) health protection (prevention) and care. Within this latter perspective the questions to be examined are how best to structure, organize and finance the entire health care system to achieve optimum effectiveness and efficiency. These are important questions which deserve constant careful attention but they extend far beyond the terms of reference of this Task Force, which was not asked to fit medical manpower objectives into a redesigned system. The task is clearly that of examining medical manpower objectives within the existing health care system in Ontario. The questions therefore are concerned with the impact of medical manpower numbers and distribution in Ontario's present system on health status, quality of care and costs.

As pointed out in Lalonde's 1974 report, the most influential determinants of health status are environment, individual lifestyles and genetic inheritance.[2] These, more than the volume or even the quality of health care, determine morbidity and mortality rates. McKeown has shown that improvement in life expectancy for western countries over the last 150 years has been largely the result of improved nutrition, better water and sewage systems and reduced family size.[3] One study attributes a mere 6% of the gain in life expectancy since 1900 to improvements in health care.[4] Several studies have shown that, in spite of the introduction of universal government-sponsored health care in the UK and Canada, the health status of the low socio-economic sectors of the population has remained low or even declined relative to the higher socio-economic sectors.[5,6,7] In other words, within the limits of an existing modern health care capability, adding attributes of universality and accessibility has not improved overall health status as defined by morbidity and mortality.

As pointed out in a brief from the Council of Ontario Universities, "Since health care services are primarily concerned with providing care to individuals when they are ill it does not make sense to measure the value of these services primarily in terms of their effects on morbidity and mortality. Greater attention should be paid to the key role health care plays in influencing the quality of life for those who have ill-health."[8] The conclusion is that assessment of medical manpower requirements by reference to some targetted reductions in mortality and morbidity rates is unrealistic.

Turning to the remaining issues, namely quality of health care and costs, it is self-evident that these have the potential for conflict. Indeed much of the friction between providers and government can be traced to perceptions about these two issues. Government on the one hand can be perceived by providers as having a single-minded preoccupation with controlling costs, if necessary at the expense of quality of care. Providers on the other hand can be viewed by government as indifferent to costs so long as they are free to provide services of their choosing whether or not such services have shown to be necessary or the best (most economical) solution among the effective alternatives.

Concerns about the impact of numbers of physicians on costs have been fuelled by a number of observations in the literature. Baltzan showed that health care costs are correlated with the number of physicians in practice.[9] Evans[10] and McClure[11] agreed that in an entrepreneurial fee-for-service health care system physicians can increase the quantity and complexity of services rendered; thereby offsetting limitations on the price of services. Reinhardt[12] and Detsky[13] have produced evidence which suggests that health care utilization is independent of need within wide limits.

Taken at face value, these studies can lead to policies designed to restrict the numbers of physicians, as for example, the measures introduced by the Government of Ontario since 1975. Other measures include reduction in the enrolment in medical schools or the setting of a physician establishment eligible to bill OHIP. Indirect approaches might be designed to increase productivity of physicians and thereby decrease the numbers required to achieve a desired level of health care in Ontario. Examples include increased use of allied health personnel, alternative practice patterns such as group practice, or encouragement of some technologies which enhance efficiency.

Those who are concerned primarily with maintaining or improving quality of care (generally the providers) point to the increasing incidence of chronic disease, the emergence of new specialties such as neonatology and geriatrics, the requirements of new technologies, aging of the population, and the needs of underserviced areas as factors creating additional demands for physicians' services. These considerations could lead to policies such as increasing the variety of specialty training opportunities, expanding the postgraduate training establishment, providing more incentives to attract additional physicians to underserviced areas, expansion of medical schools, and the introduction of "new arrangements for health care that are decentralized, promote efficiency, are sensitive to consumer demand, and create a strong provider-consumer focus."[8]

Obviously it is unacceptable to look at medical manpower from the perspective of costs alone or quality regardless of cost. The problems of health care delivery including medical manpower require recognition of the need to maintain quality *and* control costs. Policy options which tend to over-emphasize one objective at the expense of the other should be rejected. For example, too great a concern for costs could lead to arbitrary policies to reduce the size of medical schools or prohibit immigration as a means of limiting the amount of care provided, and therefore the cost, while failing to assess legitimate demand. Conversely expansion of postgraduate education to provide more specialist care and reduction of the role of family and general practice could be seen (perhaps mistakenly) as improving quality of care but at a substantial cost.

The Task Force therefore adopted as one of its objectives an examination of supply and demand for physicians projected to the year 2001 based on the assumption that the current health care system will remain in place and that medical manpower numbers should be sufficient to meet the demand which will arise. In other words the numbers should be sufficient (and no more) to maintain the quality of care characteristic of the present arrangements while allowing for innovation and for changes in demand attributable to new circumstances such as population growth and aging.

In addition there exists the possibility of changes in the health care system which could modify and in particular reduce the need for physicians without diminishing quality. Some of these changes are potentially cost-saving. In Chapter IV, therefore, these options are identified as well as the likely direction of their impact on the requirement for physicians without any attempt to quantify the consequences of their introduction. Finally, the problem of distribution of physicians, including specialists, is examined.

## Chapter 3

# The Supply and Demand for Physicians' Services

This chapter examines the current supply of physicians in Ontario, the demand for their services, trends based on historical experience and projections of future supply and demand to the end of this century. In doing so it is assumed that the current organizational and financial arrangements for delivering care will be continued with explanations as to why this approach was chosen. There is also an examination and quantification of the impact of population growth, aging, the increasing proportion of women in medicine, and the changes in productivity of physicians. In the following chapter, the impact on demand for medical manpower of possible changes in the methods of providing, organizing, and financing medical care is assessed.

### Current Physician Supply

In its Phase I report the Task Force identified seven different sources and definitions of medical manpower supply in Ontario. For the purpose of relating physicians' supply to health care demands none of the definitions is satisfactory. The consultants to the Task Force developed an alternative definition.[1] This definition is designed to count *full-time equivalent* physicians engaged in patient care. The count includes several components, the largest of which is the full-time equivalent physicians billing the Ontario Health Insurance Plan (FTE OHIP).

The use of this count allows the present and future supply of physicians actually providing care to be related to the amount of care demanded. This is the key relationship from the standpoint of medical manpower policy. It is not, however, the only important relationship. Physicians are required for teaching, research and administration and many physicians divide their time between such activities and care of patients. The Task Force knows of no way to estimate systematically what the required numbers are for purposes other than providing care but it accepts the reasoning that the actual numbers have been taken into account in calculating the number of FTE physicians in practice.

To determine the number of FTE physicians billing OHIP it is assumed that all physicians billing OHIP for $80,000 or more in 1982 were working full-time. Those billing less than $80,000 were counted as a fraction of a full-time equivalent. Thus a doctor billing $40,000 would be counted as 0.5 FTE. To obtain equivalent threshold figures for years prior to 1982 the $80,000 was deflated by the amount of fee changes from year to year as described in the Weiler report[2] (see Table 1). The number of FTE physicians providing care under OHIP is shown for each of nine years beginning in 1972–3 (Table 2).

The above calculation does not include services provided by interns and residents. The GMENAC estimate[3] that interns and residents provide an average of 0.35 full-time equivalents of patient care services was considered to be reasonable and this figure has been used in Table 2 to calculate the FTE contribution of interns and residents. Additional components of physicians providing care include all those involved in institutional or reimbursement arrangements other than through OHIP. These are listed in Table 3 for fiscal year 1981 along with the OHIP total. Thus the total FTE physicians providing patient care services in 1981 is estimated to have been 14,142.

## Projecting Future Physician Supply

The consultants developed an interactive simulation model based on historical data which were then projected into the future. The model is based on the assumption that variables are influenced by each other in ways which can be described mathematically as far as historical data are concerned. Thus for example the number of out-of-province graduates registering in Ontario is related to physician/population ratios. The model assumes further that in the future these same relationships will persist and that the variables in supply will respond as they have in the past. This assumption is applied even to variables which are constrained by policy such as immigration or the size of undergraduate classes. The argument as expressed by the consultants is that "analysts often find that government policies are not exogenous but rather that they are ultimately determined by the underlying causal factors seen from historic variation."[4]

However, it cannot be assumed that a mathematical projection necessarily represents the best estimate of what the future holds unless the model incorporates all the significant variables. Although the consultants' model is sophisticated they would not calim that it incorporates all such variables. For example, perceptions of the state of the economy have changed greatly and the pervasive influence of society's concerns about this issue surely bears on the prospects for change in policies which could modify future medical manpower supply.

Nevertheless the projection obtained by the consultants provides a useful base model. It is displayed in Table 4*. The following features should be noted:

1. The number of graduates rises gradually until 1991, then declines (Column 4).
2. The proportion of Ontario graduates settling in Ontario remains constant (Column 5). This was not a statistical prediction but a relationship imposed by the Task Force (the average proportion for 1980 and 1981). The statistical model predicted a steady decline based on historical experience. The Task Force rejected this statistical projection as being very unlikely given the forecast of large physician surpluses in the U.S. and the perception of surpluses elsewhere in Canada. A plateau based on the recent experiences (1980 and 1981) seems to be more consistent with the choices likely to be available to Ontario graduates.
3. The number of non-Ontario graduates registering in Ontario is predicted to decline steeply (Column 6).
4. The proportion of total attrition (deaths, retirements and emigration) remains constant at 2.74% (Column 7).

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*The full method of assuming the variables and developing the projection is described in the Arthur D. Little Report (1).

5. The number of physicians on the special registry* is predicted to fall by almost 80% (Column 9).

6. The population per CPSO physician† is projected to fall gradually to a figure of 523.6 (Column 12) and the population per FTE OHIP physician is projected to fall to 695.5 (Column 13).

It must be emphasized that these observations apply to a model which is essentially a statistical creation useful only as a starting point. The consultants produced a series of alternative projections based on alternative values for the variables in the model. Nine of these are included in their report.

Those reproduced here represent realistic scenarios. The most likely involves only one assumption differing from the base model, i.e. an assumption of a graduating class constant at 606 (Table 5). The additional scenarios are based on the following assumptions:

a. A 15% decrease in graduates (Table 6).

b. Entry from outside Ontario held at the levels projected in our Phase I report, i.e. 275 till 1985, then 185 till 2001 (Table 7.)

c. Maintenance of OHIP fee levels at the national average (Table 8).

The last four columns in each of these tables project the number of physicians year by year expressed in different ways. From a policy perspective (i.e. the perspective of supply in relation to requirements for care) the column displaying the ratio of FTE physicians billing OHIP to population, is the most useful and is summarized in Table 9 which shows:

1. The population per FTE OHIP physician in 1980 is 777.4

2. The population per FTE OHIP physician drops gradually to 695.5 in the base model in the year 2001.

3. The population per FTE OHIP physician for the "most likely" scenario, (i.e. number of graduates held constant) is 699.9 in 2001.

4. A 15% decrease in the number of graduates (starting immediately, which is impossible because of four classes being already enrolled) would increase the population per FTE OHIP physician by very little to 711.4.

5. If the number of physicians entering the province were to hold at the levels shown in the Phase I report (275 per year till 1985 and 185 thereafter) the population per FTE physician would decrease substantially to 640.6. This is believed to be an unlikely (though possible) projection because within the limits of present policy those entering the province will make their decisions in the light of other variables in the model. As shown by the consultants the most important of these is the number of registered

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*Physicians admitted for special purposes but ineligible for general registration.

†Physicians registered with the College of Physicians and Surgeons and residing in Ontario.

physicians in relation to population. Since this number is rising it is expected that the number entering the province probably will fall as predicted by the consultants.

6. An increase in OHIP fees to the level of the national average will cause a moderate decrease from the base model in the population per FTE physician (668.9) because such an increase in fees would make Ontario relatively more attractive for practice than it is now.*

From the above alternative projections of future physician supply, and from the Phase I report, the Task Force can identify five possible policy options for influencing the future supply of physicians. They are:

a. to control the size of medical school enrolment;

b. to control the size of the postgraduate medical establishment;

c. to use relative fees as a policy lever to increase or decrease the number of practicing physicians;

d. to control immigration into the province; and

e. some combination of the above.

The data show that the projection model is relatively insensitive to the size of the graduating classes. A reduction in class size of 15% over 20 years would result in a reduction in supply of FTE physicians billing OHIP of only 2.2% in 2001 compared to the base model. Similarly it was shown in the Phase I report that a reduction in the size of the postgraduate establishment by 15% would have little effect on the number of physicians registered in Ontario. Thus neither the option of reducing medical school class size nor that of reducing the postgraduate establishment is an effective measure for influencing the supply of physicians.

The third option, that of influencing supply by manipulation of fees would be effective as is shown by the model (Table 8). The number of physicians leaving the province would be sharply reduced by fee increases (relative to other provinces) and conversely would be increased by relatively low fees.† However, lowering fees is singularly unattractive as a means of limiting the number of physicians in Ontario because it would drive away Ontario graduates. This would be antithetical to the maintenance of high quality care because the best qualified doctors would be most likely to leave; their alternatives would be more numerous. On the other hand, should the province wish to increase the number of physicians in the future (and this may indeed by required as is shown below), one way of achieving the objective would be to make the province more attractive to Ontario graduates by increasing fees.

The fourth option is control of immigration. The model shows that the supply of physicians is highly sensitive to this variable. Immigration as defined in the model includes entries both from other countries and other provinces. It would be possible, though not without difficulties, to control immigration into Ontario in various ways. one way would be to issue permits to bill OHIP. Permits, for example, could be issued automatically, initially to all physicians practicing in Ontario. Thereafter permits could be available to all graduates of Ontario medical schools or postgraduate education programs. Additional permits up to the required number could be issued on a first-come-first-served basis subject to any priorities the government chose to recognize — such as willingness to practice for a specified time in underserviced communities or the holding of specialist certificates in fields of short supply. An alternative possibility would be to apply differential fees to practice in underserviced and overserviced locations as Quebec has begun to do. All of these methods would permit relatively rapid adjustment of the numbers of physicians to match requirements in the event of an oversupply. None however is without difficulty. Some political obstacles could be anticipated with all of them.

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*Additional scenario, presented in the Arthur D. Little report shows a dramatic decrease in the population per physician to 575.6 if the Ontario fee level were returned to its 1972 position.

†Curiously immigration into Ontario would also drop with a higher fee schedule for the reason that entry is most sensitive to the ratio of physicians to population and this ratio would rise.

Obviously any of the methods of controlling entry into Ontario from other provinces or other countries would have implications for the rest of Canada. This fact highlights a dilemma of medical manpower policy. Each province is responsible for its own policies, but objectives may be easily thwarted by the policies of other provinces and the ease of movement within the country. Ideally the provinces and the federal government should agree on the appropriate output of medical schools, the size, mix and distribution of postgraduate medical training programs and entry of physicians from other countries. There are difficulties in reaching such agreements but there is probably no other way of achieving a fully satisfactory set of policies for Canada as a whole.

The supply projections in the above models are subject to the accuracy of the assumptions on which they are based. Reiterating, the assumptions include the following:

1. A threshold of $80,000 to define full-time equivalence.
2. A value of 0.35 FTE for interns and residents.
3. A constant proportion of Ontario graduates settling in Ontario (the average of the values for 1980–81).

Modification of any of these assumptions would change the projected supply of FTE physicians.

To compensate for the uncertainties implicit in the supply projections, four different projections based on different assumptions have been used. The lowest projection is provided by the base model which (except for the proportion of Ontario graduates settling in Ontario) is a straightforward statistical projection of the experience of the past nine years. This seems to be an unrealistic projection because it does not account for the effective constraint on medical school enrolments imposed by government policy, which leaves three projections. The most likely is based on a modification to the base model which assumes continuation of the current policy on medical school size. The second projection assumes a 15% reduction in the number of Ontario graduates and is somewhat lower. The third and highest projection assumes entry from outside Ontario remains at a high level as projected in our Phase I report.

The view of the Task Force is that the projected supply is likely to be within a range bounded by the above high and low projections, barring government intervention to change policy. In short, *supply of medical manpower in the year 2001 will be between 13,388 and 14,867.* Within this range the most likely figure for supply, based on graduation from medical school remaining constant, is 13,608.

## Assessing the Number of Physicians Required

"Although many different methodologies have been put forward for determining physician manpower requirements, the various alternatives fall into two basic categories:

1. need-based models, and
2. demand-based models.

The two types of models can be distinguished as having fundamentally different objectives—i.e., they are designed to answer altogether different policy questions. A 'need-based' approach determines physician requirements consistent with the level of care that someone thinks people should have. A 'demand-based' approach, on the other hand, determines physician requirements consistent with the amount of health care that people actually demand and receive. The demand- or utilization-based approach essentially tells you how many physicians will be required in the future if the present structure and policies of the health care system are maintained. The need-based approach, on the other hand, tells you how many physicians will be required if the structure and policies of the health care system are somehow changed so as to eliminate both over- and under-utilization of health care services (however defined)."[4, 5]

The Task Force deliberated at length on this problem. There exists a perception that the Ontario system is not cost-efficient, that is, that there is (or may be) considerable over-utilization or inappropriate utilization of physicians' services. The arguments submitted include the following:

a. The consumer, paying nothing at the point of delivery, can be undiscriminating in his or her decision to seek services.

b. The doctor controls the number of visits, tests and hospitalizations and has considerable discretionary power within the boundaries of acceptable practice. Because the patient does not pay and the doctor is remunerated on a fee-for-service basis there may be an incentive for doctors to provide more services than necessary.

c. Significant numbers of services provided personally by physicians could be delegated by them to more narrowly trained personnel.

d. More effective use of allied health personnel, especially nurse practitioners could improve productivity and lower the requirement for physicians.

e. Alternative organizational arrangements for health care delivery, such as Health Service Organizations, have been shown in some cases to have a potential for reducing utilization of physicians' services.

f. New technologies may modify the requirement for physicians' services.

g. There may be unmet needs or the emergence of new needs which might offset potential savings achieved by efficient provision of services.

Given all of the above should the Task Force attempt to identify the most desirable evolution of the health care system and quantify its implications for physician requirements? In other words, should the Task Force use a need-based approach to predicting physician requirements? There was strong advice from the Council of Ontario Universities to follow this course: "Rather than focus on containing costs and attempting to do so by controlling physician supply and reducing the size of the physician training establishment, the government should encourage the development of policies and plans that allow continuing evolution of health care services based on the principles embodied in the Health Charter for Canadians, services that are sensitive to consumer demand and have incentives to be efficient. Medical manpower should be developed within a clearly articulated policy framework for the publicly-funded health care system based on some of the newer concepts for establishment of efficient effective health care services. It should take into account both supply and need considerations and consumer demand and the nature of the delivery system."[6]

Aside from the fact that an analysis of need based on hypothetical reform would not provide a basis for current policy, the Task Force perceived several other difficulties with a need-based analysis of requirements for physicians.

Although subscribing to the view that changes in the system could reduce the requirement for physicians, there is no way of knowing which changes will be introduced, when they will be introduced, how widely and quickly they will be implemented, or how responsive consumers and providers will be to alternative methods of providing care. Lacking answers to these questions it would be impossible to quantify the impact on physician requirements of modifications in the health care delivery system in the next twenty years, even though data are available on the *potential* effect of introducing innovations such as health maintenance organizations or nurse practitioners.

Whatever the future of the health care delivery system, the government is currently faced with a situation where the number of physicians in relation to population is increasing and where costs are seen to be related to the number of physicians. With no clear plan in place for modifications to achieve greater efficiency, the government cannot be satisfied to allow medical manpower numbers to drift on the vague promise that the supply will adjust to the need once reform has taken place. Alternatively, the government cannot be satisfied to defer addressing the manpower question until some, as yet undetermined, modifications in the system have been implemented and a new basis for estimating need exists.

The Task Force concluded that for current policy purposes the only useful analysis would be demand-based. it was necessary to determine the number of FTE physicians required to render the services actually provided in 1979–80 and to project the requirement for services to the year 2001 taking account of changes in the age distribution of the Ontario population and trends in productivity of physicians. The projection so obtained is an estimated of the future demand for physicians' services assuming continuation of the current health care system. If and when the current system is changed there may be modifications required in the projection of demand. Included in the next chapter is some speculation on the possible implications for medical manpower of change.

The consultants analyzed the present and future requirements for FTE OHIP physicians in the following way. In order to calculate the number of FTE physicians necessary to provide the services actually rendered in 1979–80 the total time necessary to provide the services was calculated using time standards developed in 1975 by the Requirements Committee of the National Committee on Physician Manpower.[7] For general practice and 32 specialties the time required (in minutes) for each category of service was multiplied by the number of such services provided.* This grand total was then divided by the average number of hours worked by Ontario physicians (excluding on-call time) as reported by the Ontario Medical Association, i.e. 2565 hours (Table 10). The total FTE OHIP physicians necessary to provide OHIP-paid services in 1980 was thus determined to be 10,249.

This figure can be compared with the estimated FTE OHIP physicians providing services in 1980 of 10,742 (Table 2). The estimated actual number is 4.8% higher than the estimated required number. This could be due to inaccuracy in the definition of full-time equivalents, inefficiency in physician practice, the time required for other non-OHIP-paid services such as Workmen's Compensation, over-reporting of the actual number of hours worked by physicians or under-estimate of the time required to deliver services. The Task Force agrees with the conclusion of the consultants that the close match of the estimated actual FTE OHIP physicians and the estimated required FTE OHIP physicians, given the room for error in all the estimates, constitutes a basis of confidence that the estimated actual FTE physicians in 1980 (i.e. 10,742) is an acceptable measure of requirements in that year. The figure was therefore used as a base for projecting future requirements.

### Projecting the Demand for Physicians

To project the requirements to 1991 and 2001 four adjustments were made:

1. Population adjustment: The population of Ontario is expected to increase by 8.5% (over 1980) by 1991 and 11.5% by 2001.[8]

2. Age adjustment: Older persons make greater demands on physicians than younger persons and the proportion of older persons in the population is increasing. The consultants used per capita billing of OHIP by age as a proxy for utilization. The 1980 age-specific per capita costs were multiplied by the 1991 and 2001 projected age cohorts to show the proportion of cost attributable to each age group (Table 11). The overall average cost per capita for the relevant years is:

   1980 – $119.16 – 100%
   1991 – $126.06 – 105.8%
   2001 – $130.16 – 109.2%

   Thus in 2001 it is estimated that an increase in FTE physicians of 9.2% will be required because of the increased proportion of the population in older age groups.

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*Full details are described in the Arthur D. Little report.

3. Productivity of female physicians: An increasing proportion of medical school graduates are female. Between 1965 and 1981 the percentages of female graduates of Ontario medical schools rose from 11.5% to 30%. The consultants assumed a rate of 35% per year for the female additions to supply to 2001. The Manpower Survey of the Study Group for Family Medicine in Ontario and a survey conducted by the College of Family Physicians of Canada both show that currently female physicians work an average of 75% of the hours worked by male physicians.[9,10] The impact of these two factors is estimated in Table 12 using two assumptions:

   a. that the relative hours worked by females and males will remain at its present level (female hours = 0.75 x male hours).

   b. that female working hours and male working hours will gradually converge to become equal in 2001.

   The first estimate shows a drop in "productivity" to 0.938 by the year 2001 due to the number of women physicians and the fewer hours they work. Convergence of working hours by 2001 would mean that in that year efficiency or productivity would be unaffected by the proportion of women physicians.

4. Hours of work: It was submitted to this Task Force repeatedly that recent graduates intend to work fewer hours than their older colleagues have worked. The optimal average hours worked per year, derived from consensual estimates of physicians involved in the work of the National Committee on Physician Requirements is 2243 compared to the 2565 drawn from the survey by the Ontario Medical Association for 1980. This ideal target is assumed to have been reached by 2001 and progress toward it achieved to the extent of half way by 1991.

The results are shown in Table 13. If female work hours continue to be less than male hours, which is believed to be the most likely scenario, the FTE OHIP physician requirement is projected at 15,529 for the year 2001. This figure is some 1,921 more than the most likely figure for supply (13,608) (Table 5). If, on the other hand, female productivity and male productivity converge, the shortfall in supply would be only 957.

## Comparison of Supply and Demand Projections

The general conclusion from the use of these models is that although the supply of physicians will continue to grow, the demand for their services will grow at a faster rate due to population growth, aging, and reductions in productivity.

Before considering the implications of these findings for medical manpower policy it is necessary to examine critically the reliability of the assumptions and projections and to place some appropriate confidence limits on the demand model. Projections of supply and demand are hazardous but manpower control policies depend on them. Policies to control manpower are necessary under the present health care system which we assume will continue in our estimates of manpower requirements; the government pays most of the costs of educating doctors and of services rendered by doctors.

The question is whether existing medical manpower controls are appropriate and sufficient. Supply and demand projections, whatever their weaknesses, must provide the primary evidence for determining policy within the current health care system.

Uncertainties with the demand model include the following:

1. The model assumes the estimated actual FTE OHIP physicians in 1979–80 is the number required to meet the demand. The number estimated as required by the model based on standards proposed by the National Committee on Physician Manpower is 4.8% lower.
2. The average number of hours worked by physicians is based on self-reports and may be biased.
3. Small errors in estimating the time required to deliver individual services could make significant differences in the resultant FTE physicians required.
4. The population projection represents only one (although claimed to be the best) of several alternatives presented by the Ontario Ministry of Treasury and Economics.[8]
5. The age adjustment factor assumes no significant departure from current utilization patterns.
6. The female productivity factor assumes the female additions to the physician supply will remain constant at 35%.
7. The extent of decline in average hours worked is an assumption.
8. The patterns of morbidity and consumer behaviour, and therefore demand are assumed to be constant for each age cohort over the projection period.[11]
9. The model assumes physician productivity is constant.[12]

Obviously all of these factors lend uncertainty to the projected demand. The Task Force agrees with its consultants that "the results are most reasonably viewed as being 'ballpark' estimates and that five or even ten percent variances are possible." Accordingly a similar strategy to that used in projecting supply is adopted here, and future demand within a range is identified. To do so, the two estimates of demand in Table 13 are averaged and the assumption is made that the actual demand may turn out to be as much as 10% more or less. Thus *for 2001 the demand is projected to be within a range of 13,542 to 16,552.* Again it is likely that this range will account for inaccuracies in assumptions or unanticipated influences on demand within the limits of the policies, rules and regulations currently governing the health care system in Ontario. The demand however may be modified by new or revised policies and in that case may exceed the somewhat arbitrary boundaries of ±10% which have been used.

The Task Force's estimate of ranges for supply and demand for 1991 and 2001 are shown in Figure 1. The range within which supply is predicted to fall is reasonably narrow whereas for demand it is no better than a range in which the boundaries in 2001 are some 3000 physicians apart. This fact highlights the need for caution in the introduction of new policies. The future is too uncertain to justify precise manpower targets. The supply and demand ranges overlap and while the best guess is that we may be heading for a shortage by 2001, any intervention at this time would be premature. This is especially so since the possibility exists of adjusting the supply from outside Ontario to make rapid mid-course corrections in order to solve a short term mismatch of supply and demand.

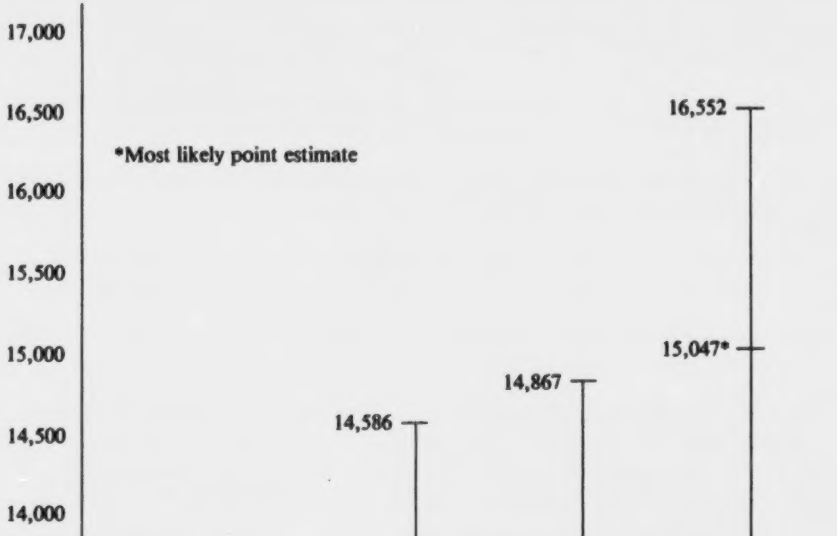

Figure 1. Ranges for Projections of Supply and Demand for FTE Physicians Billing OHIP — 1991 and 2001

# Chapter 4
# Additional Factors Bearing on Demand

In the previous chapter, the Task Force assumed that the present health care system will remain unchanged to the year 2001. The potential for new developments to modify the demand for physicians is now considered.

### New Health Care Delivery Systems

The present health care system in Ontario remunerates physicians through payment of fees for service. Other health care delivery systems which are based on different payment schemes are being tried in the United States and to a limited extent in Ontario. Health Maintenance Organizations (HMOs) in the United States are varied and involve prepaid group practices or individual practice associations. They differ in the extent of risk-sharing, profit or not-for-profit motives, and whether they control their own hospitals.[1] In Ontario, Health Service Organizations (HSOs) provide health care services on a per capita basis. In 1981, there were 17 capitated HSOs and 10 budgetted Community Health Centres[1] and like HMOs they involve a variety of organizational arrangements. Not many HSOs have been created since 1975 because the Ministry of Health has been reviewing their efficiency and effectiveness.

The major attractiveness of new delivery systems is their potential to increase the efficiency of health care system utilization. In HMOs in the United States, there have been reductions in hospitalization rates of 30% and increases in the number of ambulatory visits of 10 to 15%.[2] For HSOs in Ontario, findings concerning hospital utilization have been inconclusive and the effects on medical services have been indistinguishable from those of group practices.[1] The extent to which self-selection of enrollees in HMOs/HSOs can account for differences in costs and utilization is unknown.

If these new health care delivery systems become widely used in Ontario, the Task Force believes they could modify the demand for physicians. There would be decreases in the requirements for physicians based on evidence that physician productivity rises in group practice, and also because of increased delegation of services to allied health personnel, and fewer hospitalizations. Even if group practice became the norm in Ontario while retaining fee-for-service payment, decreases in physician requirements might occur.

The Task Force asked the consultants to conduct an analysis of the impact of widespread application in Ontario of a model used in Michigan involving prepaid group practice or HMOs.[3] The proponents of the Michigan plan claim HMOs (in the United States) excel in terms of cost-efficiency and accessibility and are at least equal with respect to quality and acceptability.

The consultants applied the standards of the Michigan model to Ontario, dividing the province into four groups based on community size. They made an age adjustment for utilization requirements, again employing the Michigan standards. A further adjustment was made for services outside of the plan, and finally additional requirements for staffing existing Ontario institutional facilities were included. Using this entirely hypothetical model the consultants showed that in 1981 the required number of physicians would be about 21% less than the actual FTE total as estimated in the supply analysis. (Table 14) There may be little confidence in the actual figures but the analysis supports the view that a multi-plan delivery system based on prepayment schemes and group practice would reduce the requirements for physicians.

## Allied Health Personnel

Allied health personnel can be defined broadly to include virtually all personnel participating in or backing up the health care delivery system. A more useful definition, especially as it relates to medical manpower requirements, is a modification of the one included in the American Public Health Services Act, i.e. individuals with training and responsibilities for supporting, complementing or supplementing the professional functions of physicians. Within this definition two categories of allied health personnel can be recognized — traditional and expanded role. Examples of the former include nurses, technologists, aides, and clerical workers, and examples of the latter are nurse practitioners and cardiovascular perfusionists.*

Some functions of traditional allied health personnel can substitute for physicians' services. These are tasks which will always be prescribed by the physician and performed either by him or by support staff on his order. Examples of such tasks are the weighing and measuring of patients, the taking of blood pressure or temperature, the administration of screening tests for vision and hearing, the performance of defined or routine diagnostic tests or the taking of a basic history, simple types of therapy and direct assistance to physicians in the performance of specific medical procedures and minor surgery.[4]

Studies have shown that the use of traditional allied health personnel increases physician productivity.[5] Reinhardt, using a simulation model, found that if the average number of aides employed by physicians in the United States were doubled, physician productivity could be increased by 30–50%.[6] Although figures for Ontario are unavailable it is likely that similar conclusions could be drawn for this province. When physicians in either solo or group practice employ several aides the volume of service rendered undoubtedly will increase substantially, but caution is required in interpreting such findings. Substitution of the services of allied health personnel for services otherwise provided by physicians will release time and allow physicians to serve more patients. The heavy overhead however may also lead to over-servicing (more tests and more visits) and thus have an undesirable effect on utilization. It is safe to conclude, however, that greater use of traditional allied health personnel has the potential to increase physician productivity and that the introduction of incentives to increase efficient use of such personnel deserves exploration.

Nurse practitioners perform an expanded role directed to the provision of primary care. Nurses performing this role have special training qualifying them for duties such as history taking, physical examinations, routine diagnostic work, monitoring of chronic conditions, and the provision of counselling and health education. They may be employed in conventional general practices, community health centres, clinics associated with medical schools, specialty units in some hospitals and in outposts. Their role, unlike that of traditional allied health personnel, involves the exercise of clinical judgement. Careful studies in Burlington and Southern Ontario have demonstrated that the outcomes of employing nurse practitioners in primary care settings (health status, quality of care, acceptability by patients) were comparable to those of conventional practice.[7] However, some of the barriers to the use of allied health personnel with expanded roles which require further study are the extent of role conflicts with physicians, the desire of physicians to avoid extra supervisory responsibilities, and the decrease in net practice income experienced by physicians who employ nurse practitioners.[5]

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*Another category of allied health personnel is the professional who provides services directly to the public. Optometrists and physiotherapists are examples.

Lomas and Stoddart developed a simulation model to estimate the proportion of FTE general practitioners that could be replaced by nurse practitioners in a twenty year period (by 2001).[8] They concluded that given a policy decision to achieve the full potential of nurse practitioners, and no obstacles to full-scale rapid implementation, reductions in medical manpower requirements of 20 to 32 percent could be achieved by 2001 (Table 15). This model, as pointed out by its authors, assumes instant elimination of disincentives such as professional and regulatory obstacles, economic obstacles such as OHIP billing restrictions, and attitudinal barriers to widespread substitution for the role of the physician. These barriers and obstacles are formidable and lead the Task Force to conclude that, practically, the potential implied by Lomas and Stoddart over the next 20 years cannot be realized. Nevertheless the potential for nurse practitioners to reduce the requirement for physicians is genuine and effective development of this type of change in health care delivery deserves serious attention.

### New Technologies

Technological advances in medicine such as kidney dialysis and high technology imaging (CAT scanner and ultrasound) while improving treatment or diagnosis, have added new workloads to medical practices. Particular technologies may simplify and reduce the overall time devoted to medical care; others will increase the time required. The net effect of all technological advances is unpredictable and their impacts on physician requirements are equally uncertain and unquantifiable.

New medical technologies generally emerge through three phases — innovation, development and diffusion. In general, physician input is likely to be highest during the first two stages. Once the technology has been fully developed, the requirements for physicians may fall with a simultaneous increase of the requirement for allied health personnel.[9] These outcomes however are unpredictable. The technology associated with procedures such as organ transplant, and open heart surgery undoubtedly causes an increase in demand for physicians' services. Some technologies, however, lead to greater efficiency and therefore decreases in physician requirements. Examples include computerization and automation in the clinical laboratory, telemetry, use of picture phones, communication satellites, laser technology. In short, new technologies have two opposite impacts — increasing demand on the one hand and increasing efficiency on the other. The net effect of all new technology on the requirement for physicians is simply unpredictable although, as pointed out by Fuchs, technological development in the latter part of this century has so far resulted in substantial increases in utilization of health care services.[10]

Illustrative of the difficulty in predicting the future impact of technology are the conclusions of delphi panels of physician specialists engaged by the National Committee on Physician Manpower, 1975.[11] These panels attempted to predict the impact of new and developing technologies on their specialties. "It was extremely difficult for panels of physician specialists to come to terms with the impact of technological developments on future medical manpower requirements... Physicians were instructed to offer a reasonable 'guesstimate' of what the impact would be on physician productivity and demand for their services (an equally impossible task). The lack of a consistent empirical methodology in their deliberations was indicative of the degree of uncertainty in their findings. However, most specialty groups found public attitude toward technological advancements to be favourable and that the demand for their services would parallel population growth."[12]

The Task Force concludes that technological evolution, which will certainly continue, may have an impact on physician demand especially in relevant specialties. On the whole, it seems more likely that such impact will increase rather than decrease the requirements for physicians.

**Unmet Needs**

The Task Force has modelled its projections for physician requirements on demand rather than need and the possibility exists that unmet need or changing need may be translated into new demand during the next twenty years. Examples of such possibilities include the following:

a. Inadequate services in remote geographic communities: Some parts of the province currently are underserviced. Clearly, the ideal solution to this problem would be redistribution of physicians to these areas from overserviced communities. To the extent that this proves impractical, a demand for additional services will persist in underserviced locations.

b. Inadequate numbers of certain kinds of specialists: The Minister has identified a need for expansion of numbers of specialists in family medicine, community medicine and public health, radiation oncology, psychiatry, anaesthesia, rehabilitation medicine, geriatrics, emergency medicine and neonatology. These represent areas of unmet need and some certainly represent areas where need may be translated into new demand — for example, geriatrics, emergency medicine, neonatology and radiation oncology.

c. Shifting consumer emphasis on prevention: Growing concerns about lifestyle and its bearing on health may create new demands for medical counselling related to nutrition, exercise, and the use of alcohol and tobacco.

d. Shifting morbidity patterns: Coronary disease has been decreasing, some cancer and chronic disease rates are increasing, life expectancy is increasing, and survival rates from some cancers are improving. All of these changes affect patterns of morbidity in the population and therefore demand for physicians' services. Overall, increasing life expectancy and improving survival rates may be the most important variables and these factors will lead to increasing demand.

e. Chemical and physical environment: The pollution of air and water with man-made chemicals, extensive use of food additives, crowding, anomie and similar factors are modifying the environment and producing interactions and long-term effects which are not fully understood. Large populations exposed to such environments may carry a new kind of disease burden in the future.

The demands created by these factors in the future probably will increase the requirements for physicians.

## Conclusions

In this chapter a number of imponderables which could not be quantified and incorporated into the model of future demand have been identified. Some of these present opportunities for policy innovation and deliberate modification of the system to enhance effectiveness and efficiency; others are beyond the reach of policy and may turn out to have highly significant effects on demand. In the first category are included modifications in health care delivery arrangements to encourage competitive prepayment-based organizations or group practices and promotion of more effective use of allied health personnel, especially nurse practitioners. Action plans based on current knowledge should be explored intensively in relation to both these options. If substantive reform results, it will be necessary to re-examine future demand for medical manpower in the light of experience in a new and different health care system.

In so far as the remaining variables are concerned, i.e. technological developments and the emergence of new demand based on unmet or changing need, it will be important to watch trends closely because unanticipated developments may lead to significant modifications in demand. In the judgement of the Task Force such modification will likely be in an upward direction.

## Chapter 5

# The Geographic Distribution of Physicians

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### Is there a maldistribution of physicians?

In public surveys conducted in Ontario, people perceived shortages of physicians to exist in the eastern, southwestern and northern regions of Ontario.[1] In many of the briefs and letters received by this Task Force, the distribution of physicians was seen as a problem with a particular emphasis on perceived shortages of specialists. There are anecdotes on the one hand describing the difficulty in finding and retaining physicians in small towns in the north, and on the other hand, points of view which say that northern communities are adequately serviced except for spot shortages of certain specialists. However, there are few data to substantiate or disprove these perceptions. It is difficult therefore, to determine the extent of the problem of physical access to physicians in some areas of the province.

One criterion for determining the equality of access to medical services is the physician to population ratio. At the broadest possible level, Ontario's physician to population ratio compares favourably with those for the rest of Canada and other countries (Table 16). However, if the ratios are calculated on a regional or county basis, inequalities appear (Table 17). Comparing these ratios, it has been argued that there is a problem of physical access to medical services for people in some counties and that it is due to the uneven distribution of the physicians available. But are the counties with the highest population to physician ratios necessarily underserviced relative to counties with low ratios? Other factors such as accessibility to services across county boundaries, different patterns of morbidity, and the availability of transportation facilities determine the extent to which inequalities exist. It may also be the case that counties with high population to physician ratios are not underserviced but rather that those with low ratios are overserviced.

Differences between population to physician ratios in communities may describe physician distribution problems more realistically than county data because perceptions of accessibility are formed at the community level. However, studies such as those done by Rosenberg[2] and Garcia[3] showing the variability in physician to population ratios for 260 to 288 Ontario communities from 1956 to 1981 are difficult to interpret. The changes in distribution of physicians observed over that time period may or may not indicate that physicians are distributed more equitably now than in the past. For example, some counties with high population to physician ratios are adjacent to counties with Health Sciences Centres. Further data collection and analysis of the geographic distribution of physicians are required in order to assess the extent to which perceptions of inequities can be corroborated.

### Improving the Distribution of Physicians

Several policies and programs exist in Ontario to try to meet the physician requirements of underserviced areas and communities. The following list of such programs illustrates their variety and comprehensiveness.

*OHIP:* The introduction of universal health insurance in 1969 operated by the government of Ontario makes it possible for physicians anywhere in the province to receive the same fees for the same services. This has removed an income barrier which may have prevented physicians from locating in smaller communities in the north.

*Underserviced Area Program:* This is the major Ministry program addressing the problem of physician distribution in Ontario and has been operating as a service of the Ministry of Health since 1969. Communities are designated as underserviced on the basis of factors such as number and age of physicians, practice loads, community characteristics (age, distance to next community) and special circumstances (provincial parks or summer camps etc.) and not on a simple physician to population ratio. The director of the program has been Dr. William J. Copeman since 1969 and one of the main reasons for its success is its non-bureaucratic structure which allows Dr. Copeman the flexibility to handle a variety of health service problems encountered by underserviced communities. Ontario's Underserviced Area Program is not only the largest government-sponsored program of its kind in North America but it is also unique in that it gives physicians the opportunity to choose where they want to go and it relies on personal contacts with physicians and the communities for its success. A description of the 10 components of the Underserviced Area Program (UAP) follows.[4]

1. *Placement of Family Physicians/General Practioners*

   The postgraduate physician whose application has been approved by a Medical Selection Committee is eligible for an income tax-free incentive grant of $40,000 paid over 4 years if he chooses to practise in a community designated as underserviced in northern Ontario. In southern Ontario, the UAP will assist underserviced communities in recruiting physicians but without the incentives of a grant. If the community is unsuccessful in recruiting a physician after one year, a level of financial support is made available but at a lower rate than in the north. Between 1969 and 1979, 499 physicians had been on UAP and as of September 1979, 275 were in practice.[5] As of January 1983, some 173 communities have been designated underserviced, and approximately 28 remain on the "active" list.

2. *Incentive Grants for Specialists*

   This component of UAP began in 1978 and includes approximately 35 to 40 specialists who have been placed on a full-time basis in communities in northern Ontario. Specialists are offered tax-free incentive grants which were $20,000 paid over 4 years as of 1982. The program has only been in operation for a few years but the turnover has been high.[5] It is difficult to ascertain how many specialists are really needed unless the community complains. As of 1982, psychiatrists, anaesthetists and ophthalmologists were in demand.

3. *Travelling Specialists*

   Since 1978, a program of specialist visits on a part-time basis has been operating under UAP. Specialists are given travel, accommodation, meals, an honorarium and payment on a per diem or fee-for-service basis to make special visits when required.

4. *Locum Tenens Pool*

When physicians are ill, taking holidays or undergoing postgraduate training or when health services in a community are seriously impaired, the Ministry of Health hires a physician on a short-term basis.* This action is an emergency measure designed to maintain service until full-time physician services can be re-established.[5]

5. *Nursing Stations*

For communities which are too isolated and too small for full-time physicians, the Ministry of Health has hired registered nurses and created 14 nursing stations†. Back-up physician advice is available by telephone and a physician from a nearby community visits the station once a week.

6. *Rotational Services for Isolated Communities*

For two isolated communities in the far north, Armstrong and Pickle Lake, UAP arranged with the College of Family Physicians to provide full-time services on a rotational basis from within its membership. This has proven to be a successful liaison from 1974 to 1982. As of 1983, the program will continue but its administration will be carried out by a different group.

7. *Annual Physician Recruitment Tour*

Every community in the north is invited to send representatives on a 5-day tour of the 5 medical schools in southern Ontario to actively recruit physicians for their communities. This venture is financed by the Ministry of Northern Affairs, the Ministry of Health and the communities themselves. Although originally created for the recruitment of physicians, UAP will assist northern communities in finding other kinds of health manpower such as dentists, speech pathologists and physiotherapists.

8. *Undergraduate Medical Bursaries*

Undergraduate medical bursaries were a part of the Underserviced Area Program from 1969 to 1974 and were reinstated in 1978. The Ministry of Northern Affairs currently finances 45 bursaries of $5000 each per year. Students who receive these bursaries agree to spend, upon completion of their internships, one calendar year in practice for each year of academic financial assistance received in an area designated as underserviced. They are also entitled to receive the full incentive grants. Those who choose to undertake postgraduate training in specialties not related to family practice or who do not practise in underserviced areas are required to repay the bursaries with interest. In the 1969 to 1974 period 220 students received bursaries, 110 fulfilled their obligations and of those 73 remained in the community after their obligation was fulfilled.[5]

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*The OMA also maintains a locum tenens pool and although their list is maintained separately from that of the UAP, the two cooperate very closely.

†Nursing stations are also supplied to Indian Reservations by the federal Department of Indian Affairs and Northern Development.

9. *Construction of Health Centres*

   It is the responsibility of the local community to provide good clinic facilities and housing at a reasonable rental. The presence of good facilities has been an asset in attracting physicians. The Ministry plays a role in helping the community design its medical center and find financing where necessary. Using this assistance, "almost 100 communities have built modern, attractive health centres."[5]

10. *Conditional Work Permits*

    For non-Canadian physicians who are eligible for an Ontario license and whose applications are approved by the medical selection committee of the Underserviced Area Program, work visas are supplied for one year if the physicians will go to underserviced areas. After one year, if their work is satisfactory and they make a commitment to remain in underserviced communities for 2 more years, they receive assistance in getting landed immigrant status. There have been approximately 20–30 physicians in this program since 1969.[4] The disadvantage of this program has been that such physicians have shown a tendency to move on once they have become landed immigrants.

*Northwestern Ontario Medical Program (NOMP):* This Ministry of Health-funded program places medical students, interns and residents from Ontario medical schools in community-based teaching practices in northwestern Ontario communities including Thunder Bay. These placements can be up to 1 year but are usually 1 to 3 months. The rationale behind this program is to expose Ontario students and residents to Northern Ontario before graduation. This educational experience is open to all Ontario medical students and is designed to improve the skills of the student, familiarize the student with the northern practice environment, and provide teaching careers for physicians in the north. In existence since 1972, NOMP is based in Thunder Bay with administrative back-up by McMaster University. Many NOMP graduates tend to establish permanent practices in underserviced areas and remote sites. In a recent tracking study of 211 medical students, interns and residents who chose elective rotations in NOMP as part of their medical training from 1972 to 1982, 54 have established practice as physicians in northern Ontario and a further 25 in remote settings elsewhere in Canada.[6]

*Linkages Between University Teaching Hospitals and Northern Communities:* Linkages exist between Sioux Lookout Zone Hospital and University of Toronto, University of Ottawa and Sudbury, and Sudbury's proposed psychiatric link to University of Western Ontario. University of Western Ontario's Outreach Program also represents an attempt to provide community and hospital learning experiences for interns and residents and specialized expertise to some northern communities.

*Interactive Telecommunications:* The Telemedicine Branch of the Ministry of Health focuses on encouraging systematic linkages between remote areas and major referral centres. Telecommunications links have been used mainly for continuing education purposes, although the service has also been used for consultations (by sending X-rays, doing speech pathology assessments and psychiatric assessments). "Telehealth for Ontario", a continuing education project of Toronto General Hospital, uses a teleconference bridge which has the capacity to link up to 20 sites on one conference call. At present, the only two-way hospital television communication system that operates on a daily basis in Canada is between the

University Hospital in London Ontario and the Woodstock General Hospital. This linkage is a pilot project for the development of interactive telecommunications in the North. Although the technology is costly, it is viewed as a way to make specialty health services more accessible. On an experimental basis, the Sudbury-Algoma Hospital and the North Bay Psychiatric Hospital have used two-way interactive television. In northern Ontario, the District Health Councils have formed planning groups to look at the kinds of telecommunications best suited to their needs.[7] The emphasis is on establishing north to north links rather than north to south links.

*Air Ambulance Services:* There are 4 aircraft used exclusively for ambulance services in the north as of July 1981. Helicopters in Sudbury and Thunder Bay serve those 2 centres for a radius of 250 miles. Fixed wing aircraft serving areas with 250-mile radii around Timmins and Sioux Lookout take patients to major referral centres in Thunder Bay, Winnipeg and Toronto. Small chartered aircraft service all remaining areas as the need arises which amounts to 42% of all flights and 49% of the patients. Between July 1981 and July 1982, 7253 patient transfers were handled using air ambulance service in the north.

## Conclusions

As has already been pointed out, there are insufficient data to assess the dimension of the problem of physician distribution in Ontario. Although there are many programs which have been created to address the perceived needs of communities in the north, there is little evidence available with which to assess their effectiveness.

The Underserviced Area Program, for example, is the largest government-sponsored program of its kind in North America and it has been eyed with interest by many jurisidictions in Canada, the United States and elsewhere because it appears to be successful yet it has never been evaluated. The Task Force is impressed with the imaginative and practical approach which has been used and is convinced that it has made important contributions to improving access to health services for many northern and smaller communities. This program should be evaluated to determine which of its elements have been most effective and to disclose possible opportunities for improvement.

As part of this evaluation of the Underserviced Area Program, the medical school-sponsored educational programs in northern Ontario should also be evaluated. Investigation into methods by which these existing medical school programs can be coordinated may uncover unnecessary duplication and improve the scope and quality of the programs. It is also important that research into northern health service problems use a northern perspective. Thus the study committee for evaluating both the Underserviced Area Program and the university-sponsored programs ought to be largely made up of representatives of northern concerns and communities.

Some of the data which are needed include:

a. trend data on the numbers and distribution of general practitioners and specialists by community, county/district and region;

b. tracking studies of Ontario medical school graduates who practise in the north and their backgrounds;

c. survey of all physicians practising in the north examining the permanence of their practice and referral patterns;

d. travel patterns of the patients;

e. age of physicians, and

f. the number and location of French-speaking physicians.

Despite the evidence that this issue deserves further study, the Task Force believes that all of the current programs which address the issue of providing service to northern Ontario are available and should be continued until the results of the evaluation become available.

## Chapter 6

# Re-examination of Postgraduate Medical Education

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In the first report of this Task Force, "Interns and Residents", the relationship between the existing establishment of interns and residents and the projected supply of physicians was assessed. Recommendations were presented concerning policy for postgraduate medical training. These were done in the light of the data and projections available at the time but the intention was to examine questions of supply and demand more thoroughly in the final report. Having done so in the preceeding chapters, the findings and recommendations on postgraduate medical education are re-examined in this chapter.

### Review Of Phase I

The Phase I study was undertaken against a backdrop of a Ministerial announcement in 1981 of his intention to reduce the number of government-funded positions for interns and residents from its 1981 level of 2502 as follows:

1982 reduction of 50 = 2452
1983 reduction of 125 = 2327
1984 reduction of 125 = 2202
1985 reduction of 125 = 2077

These reductions were to take place unless the Task Force showed cause why they should not or showed why an alternative proposal would be more desirable.

The Minister in a letter to the Chairman of the Task Force expressed concerns that a) there is an oversupply of physicians in Ontario and other provinces, b) perhaps half of the specialists trained in Ontario move to other provinces, and c) resolute measures are required to reverse trends toward an oversupply in Ontario. The specific objectives of the proposed cuts were to:

a. adjust specialty training so that in the long run not more than 45% of Ontario physicians are specialists;

b. improve the recruitment of qualified Ontario and Canadian applicants into specialties in short supply;

c. through improved recruitment reduce the number of unsuccessful trainees and improve the utilization of existing posts.

The Task Force using existing supply projections concluded that indeed the number of physicians in relation to population would continue to increase during the next 20 years but also identified a number of factors which will modify the demand for services.

The Task Force examined the role of postgraduate medical education in providing physicians for Ontario and showed that the proposed reductions would be insignificant in relation to the total of other sources of supply which include:

a. graduates of Ontario schools who have obtained postgraduate training outside of Ontario;

b. graduates of other provinces who have obtained postgraduate training outside of Ontario;

c. Canadian graduates of foreign medical schools who have obtained postgraduate training outside of Ontario;

d. foreign medical graduates who have obtained postgraduate training outside of Ontario.

The Task Force reviewed the additional matters which were of concern to the Minister and concluded that there was:

1. no evidence at this time to justify one particular ratio of physicians to population as the most appropriate to meet Ontario's needs;

2. no evidence for a current oversupply of physicians in total in Ontario;

3. a concern shared with the Minister about the trend to increasing supply;

4. an understanding of the Minister's concern that the output of Ontario's programs destined for other provinces may exceed requirements in the 1980's;

5. no anticipation that a reduction of 17% in the number of interns and residents would significantly affect the supply of physicians settling in Ontario;

6. no need to adjust the ratio of general practitioners to specialists in the postgraduate establishment either to achieve the Minister's objective of a ratio of 55:45 (because the ratio has been holding at that position) or to achieve an ideal ratio established by empirical analysis;

7. a concern that, although the Low Report[1] supports the current ratio of active general practitioners to specialists, it calls for a relative increase in the number of specialists in the 1980's, and that this inconsistency required review by the Council of Ontario Faculties of Medicine;

8. no reason to believe that a reduction in number of interns and residents would favour recruitment to specialties in short supply;

9. the expectation that since the Deans plan to recruit the best qualified candidates, the cuts, if implemented, would result in a decrease in the small attrition from training programs attributable to academic considerations.

The Task Force examined the probable consequences of the proposed reductions in funded positions on education, research and service in the teaching hospitals and found that the cuts would be disruptive.

Finally, the Task Force considered the question of the appropriate size of the Ministry of Health funded postgraduate training establishment and concluded that the size should be sufficient to:

1. produce an output which in the absence of movement in or out of the province would allow Ontario to be self-sufficient in terms of total numbers of doctors;
2. maintain the current ratio of active physicians to population;
3. meet Ontario's current obligation to provide specialist training for other provinces;
4. allow a margin of safety of 10% to meet additional future needs arising because of an aging population, an increase in the proportion of women physicians, changing work habits, new technology, new specialties and possibly other factors.

The size which would be required to meet these objectives was calculated and, allowing for some additions attributable to interns entering practice after only one year and the existence of some non-Ministry funded residencies, was found to be consistent with the number which the Minister proposed to fund, i.e. 2077 places.

There was, therefore, in relation to the desirable size of the postgraduate training programs no cause to reject the Minister's proposed total reduction. It was recommended, however, that if the Minister decided to proceed with his plan to reduce the Ministry-funded places by 425, by 1985, he should do so only provided that he make a commitment to meet the audited costs of teaching hospitals attributable to the service requirements otherwise met by interns and residents lost as a result of reductions in funded posts.

Following the acceptance of the Phase I Report of the Task Force by the Ontario Council of Health and submission of the Report to the Minister of Health, the Minister decided to implement the proposed cut of 125 places in 1983 but to defer a decision on subsequent cuts pending receipt of the final report of the Task Force. In making his announcement, however, the Minister did not express any intention of meeting the audited costs of replacing the services which would have been provided by the interns and residents now lost to the system.

The Minister did state that he would permit the lost positions to be reinstated by additions to the numbers of places in specialties in short supply. These include family medicine, community medicine and public health, radiation oncology, psychiatry, anaesthesia, rehabilitation medicine, geriatrics, emergency medicine and neonatology.

The Task Force has been informed that all 125 'lost' positions have been restored for 1983 by additional allocations to the fields designated as eligible by the Minister.

## Reassessment of Size of Postgraduate Establishment

The Task Force has now carried out its own studies of supply and demand to the year 2001 and re-examined its Phase I advice in the light of projected demand. To do so the Task Force rephrased its definition of the appropriate size for the Ministry of Health funded postgraduate medical training establishment to take account of our projections of demand. The appropriate size should be sufficient to:

1. produce an output which in the absence of movement in or out of the province would allow Ontario to be self-sufficient in terms of total numbers of doctors;

2. provide a supply within the range of the anticipated demand;

3. meet Ontario's current obligation to provide specialist training for other provinces.

An approximation of the supply which would be available in 2001 if the Minister's proposed establishment of 2077 places were implemented and if the entire output settled in Ontario with no movement in or out has been calculated (Table 18)*. The figure obtained is 12,962. This represents a mathematical calculation of a hypothetical situation which no doubt will never come to pass. It is, however, an acceptable basis of assessing the appropriate size of the postgraduate establishment because it means that Ontario would not be dependent on other training programs for its supply of specialists. It can be seen by comparing the figure with the projected range of demand in Figure 1 that the additions to supply using the entire output of the postgraduate training would fall short of the lowest boundary for demand and some 2500 doctors less than the most likely projection of demand.

This possible shortfall in supply of medical manpower in 2001 (if all proposed cuts are fully implemented), could be overcome and perhaps exceeded by the physicians supplied by non-Ministry of Health funded postgraduate trainees and immigration. However, Ontario would not necessarily be assured of self-sufficiency in its training of specialists and there would be disruptions to the quality of education and service in the teaching hospitals.

An alternative would be to proceed only with the announced 1983 reduction of 125 places and cancel the planned reductions in 1984 and 1985. The number of funded places would then be 2327 and the supply projection for 2001 would be 13,968. This figure is within the range of projected demand. Thus if no more cuts are made after 1983 and even if the 125 positions slated to be cut in 1983 were not added back in specialties of short supply, Ontario would be self-sufficient in the training of its medical manpower requirements.

Accordingly, to be consistent with the Task Force's definition of the appropriate size of the postgraduate establishment, it is the view of the Task Force that no further cuts in the number of Ministry-funded places should take place beyond the announced reduction of 125 places in 1983.

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*This calculation ignores the growing number of places funded from sources other than the Ministry of Health because it is the Task Force's contention that the Ministry-funded program should be large enough to ensure self-sufficiency regardless of other sources of supply.

## Chapter 7

# Conclusions and Recommendations

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### Summary and Conclusions

This report deals with the issues of the total numbers of physicians required in Ontario and their distribution within the framework of two general policy objectives:

1. *That the quality of medical care characteristic of the present arrangements be maintained.*

2. *That the costs of the health care system be controlled.*

Within this framework, the numbers and distribution of medical manpower were examined on the assumption that the current health care system would remain in place. The Task Force also identified a number of possible modifications to the health care system which could reduce the need for physicians and are potentially cost-saving.

The Task Force re-examined the advice contained in its preliminary report on postgraduate medical education in the light of its analyses of supply and demand for physicians services.

### The Supply of and Demand for Physicians

Based on studies of the time required to provide individual services and the numbers of services actually provided, the Task Force concluded *that the number of full-time equivalent (FTE) physicians billing OHIP in 1980 was consistent with the number of physicians required for the services rendered.*

Future supply of physicians (to 2001) was projected on the basis of alternative assumptions, namely (a) maintaining the current medical school enrolment (the most likely projection), (b) reducing medical school enrolment by 15% (the low projection), and (3) maintaining immigration of physicians at the high levels projected in the Phase I report (the high projection). The Task Force concluded that *the supply of FTE physicians in 2001 is likely to be within a range of 13,388 and 14,867, barring intervention to change the health care system.*

The demand for physicians was projected taking into account (a) the growth of Ontario's population, (b) the greater demands for services from an increase in the proportion of persons in the older age groups, (c) the increasing proportion of women practitioners and the relatively fewer hours they work on average, and (d) the trend towards fewer hours of work for all physicians. The Task Force concluded that *the demand in 2001 for FTE physicians services is likely to be within a range of 13,543 and 16,552.*

*Over the 20 year period to 2001 both supply and demand are projected to grow but demand is likely to grow at a faster rate than supply. Within the framework of current policies the demand for physicians services in 2001 may exceed the supply.*

The simulation model presented in this report is a useful tool for assessing the relative potential significance of alternative policy options even though projections of supply and demand are subject to error and cannot be used to set precise manpower targets.

The policy options for affecting the supply of medical manpower are:

1. to control the size of medical school enrolment;
2. to control the size of the postgraduate medical establishment;
3. to control entry of physicians to Ontario from other provinces and from outside Canada;
4. to use the relationship of Ontario physicians' fees to those of the other provinces in Canada;
5. to modify the requirements for physicians' services without diminishing quality of care by means of other systems of health care delivery, more effective use of allied health personnel, and disease prevention and health promotion techniques;
6. to use some combination of the above.

The simulation model of physician supply was relatively insensitive to the size of the graduating classes; thus *neither reducing the medical school enrolment nor reducing the size of the postgraduate training establishment would be effective for influencing the supply of physicians.*

*The supply of physicians will respond rapidly to changes in the numbers of physicians entering Ontario from other provinces and from other countries. Manipulation of this component of supply is potentially the most flexible, rapid and effective way of modifying supply.* This could be achieved through a system of permits, licensing regulations, or differential fees. Any of these methods would involve political considerations both provincially and nationally.

Lowering fees to limit the number of physicians is unattractive but, *in the event of an anticipated shortfall in supply of physicians, an increase in fees would increase the supply of highly qualified physicians.*

A number of possible developments have the potential to modify the demand for physicians' services.

1. *A new multi-plan delivery system based on pre-payment schemes and group practice has the potential to reduce the requirements for physicians.*
2. *The more effective use of allied health personnel, especially nurse practitioners, has the potential to significantly reduce the demand for physicians' services.*

3. *The net effect of new technology probably will be to increase the requirement for physicians.*

4. *Finally, unmet or changing need may be translated into additional demand, thus increasing the requirements for physicians.* Examples of such possibilities include unmet needs in underserviced communities, inadequate numbers of certain kinds of specialists, a shifting consumer emphasis on prevention, shifting morbidity patterns, and morbidity increases attributable to problems of the environment.

In summary, given that there is currently a balance between the supply of and demand for medical manpower, it would seem appropriate to adopt a combination of the above policies; in other words, to continue the current policies with respect to the number of medical school enrolments and limit the immigration of physicians from other countries while at the same time exploring options for modifying the requirements for physicians' services, monitoring the balance between projected supply and demand in light of new or better data, and varying conditions for the entry of physicians from other provinces and other countries to meet short term divergencies between supply and demand.

### The Geographic Distribution of Physicians

There are no data to determine whether there is a problem of physical access to physicians in Ontario and where the areas of possible oversupply or undersupply are. The northern region of the province and rural areas generally have fewer physicians per capita than most of southern Ontario.

Several policies and programs exist in Ontario to try to meet the physician requirements of underserviced areas and communities. These include:

1. the improvement of incomes of physicians in northern Ontario attributable to the introduction of OHIP;

2. the Ministry of Health's Underserviced Area Program involving 10 different components:

    a. placement of family physicians/general practitioners

    b. incentive grants for specialists

    c. travelling specialists

    d. locum tenens pool

    e. nursing stations

    f. rotational services for isolated communities

    g. annual physician recruitment tour

    h. undergraduate medical bursaries
    i. construction of health centers
    j. conditional work permits;

3. the Northwestern Ontario Medical Program involving placement of students, interns and residents from the five medical schools in community teaching practices;
4. linkages between university teaching hospitals and northern communities;
5. interactive telecommunications;
6. air ambulance services.

*Data are inadequate to assess accurately the overall success of these programs in meeting the needs of northern Ontario but there is little evidence that new programs are required.*

**The Postgraduate Medical Establishment**

The Task Force reviewed its advice on postgraduate education in light of its findings on projected demand for physicians' services. Paraphrasing its earlier advice, the Task Force concluded that *the size of the Ministry of Health funded postgraduate medical establishment should be sufficient to:*

1. *produce an output which, in the absence of movement in or out of the province, would allow Ontario to be self-sufficient in terms of total numbers of doctors;*
2. *provide a supply within the range of the anticipated demand;*
3. *meet Ontario's current obligation to provide specialist training for other provinces.*

*If the Minister were to implement the entire series of planned reductions in positions, the output of the Ministry of Health funded positions would be insufficient to fulfill Ontario's anticipated requirements for physicians in 2001.*

*If the Minister were to proceed only with the announced 1983 reduction of 125 places and cancel the planned reductions in 1984 and 1985, the output of the Ministry of Health funded positions would be sufficient to bring the supply within the range of anticipated demand in 2001.*

**Recommendations**

The Task Force recommends to the Ontario Council of Health that it advise the Minister of Health:

1. *to maintain a balance between supply of full-time equivalent physicians and the demand for their services;*

2. *to maintain the current policy regarding the size of medical school enrolment in Ontario by keeping the number of graduates at 606 per year;*
3. *to monitor the entry of physicians from outside Ontario and limit or open up immigration from other countries according to the demand for medical manpower;*
4. *to not interfere further in policies affecting supply of physicians until there is clear evidence that the supply will not meet the demand or that it will exceed the demand;*
5. *to improve and maintain a data base to provide information on the supply of and requirements for medical manpower;*
6. *to maintain a simulation model in order to monitor and adjust policy regarding the balance between the supply of and demand for medical manpower;*
7. *to explore the potential to increase physician productivity through policies such as those that would provide more effective use of allied health personnel and the development of multi-plan delivery systems based on prepayment and group practice;*
8. *to modify projections of demand in the event that the Ontario health care system is substantively modified;*
9. *to evaluate government-sponsored and university-sponsored programs in Northern Ontario including the Underserviced Area Program and other manpower-related educational and service programs with a view to coordinating and improving the effectiveness of these programs;*
10. *to create and maintain a data base in order to monitor the distribution of physicians' services in Ontario;*
11. *to make no further reductions in Ministry of Health funded places for interns and residents beyond those scheduled for 1983.*

# Reference Notes

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## Chapter I—Introduction

1. Ontario Budget 1970–1 and 1980–1.
2. Marc A. Baltzan, "Medical Care Costs and Physician Manpower: A New Economic Theory," *CMA Journal*, 108 (1973): 101.
3. Victor R. Fuchs and M.J. Kramer, *Determinants of Expenditures for Physicians' Services in the United States*, Discussion Paper No. 117 National Bureau of Economic Research, DHEW Publication No. HSM-73-3013, December 1972.
4. Dennis Timbrell, Letter to R.B. Holmes, November 6, 1981.
5. Emmett M. Hall, "Canada's National Provincial Health Program for the 1980's", (Ottawa: Department of National Health and Welfare, 1980).

## Chapter II—Medical Manpower Issues

1. Council of Ontario Faculties of Medicine Postgraduate Manpower Committee, *Graduate Medical Education—Guidelines to the Resident Establishment*, (The Low Report) 1981.
2. Marc Lalonde, *A New Perspective on the Health of Canadians* (Ottawa: Information Canada, 1974).
3. Thomas McKeown, *The Modern Rise of Population*, (London: Edward Arnold, 1976).
4. M.S. Mueller and R.M. Gibson, "Social Security", *Security Bulletin* 39 (2) (1976): 3.
5. Department of Health and Social Services, "Inequalities in Health", Report of a research working group (Chairman, D. Black), (London: Department Health & Social Services, 1980).
6. R. Wilkins, *Health Status in Canada, 1926–76*, (Montreal: Institute for Research on Public Policy, Occasional Paper No. 13, 1980).
7. Health and Welfare Canada "Mortality by Income Level in Urban Canada", (Ottawa: Information Canada, 1974).

8. Council of Ontario Universities, "Report of the Task Force on Medical Manpower", Brief to the OCH Task Force on Medical Manpower, (Toronto: COU, 1982).

9. Marc A. Baltzan, "Medical Care Costs and Physician Manpower: A New Economic Theory", *CMA Journal* 108 (1973): 101.

10. Robert G. Evans, "Supplier-induced Demand: Some Empirical Evidence and Implications," in *The Economics of Health and Medical Care,* N. Pearlman, ed. (Toronto: John Wiley & Sons, 1974), p. 163.

11. Walter McClure, *The Competition Strategy for Medical Care,* (Minneapolis: Centre for Policy Studies, 1982) p. 9.

12. Uwe E. Reinhardt, *Physician Productivity and the Demand for Health Manpower—An Economic Analysis,* (Cambridge: Ballinger Publishing Company, 1975).

13. Allan S. Detsky, *The Economic Foundations of National Health Policy,* (Cambridge: Ballinger Publishing Company, 1978).

## Chapter III—The Supply and Demand for Physicians' Services

1. The Task Force engaged the services of Arthur D. Little of Canada Inc. to conduct studies on physician supply and demand in Ontario. The report of their studies is entitled "Projections of Physician Supply and Demand in Ontario to the year 2001" and is available through the Ontario Council of Health. The data in this chapter are drawn from the report.

2. Paul C. Weiler, *Report of the Chairman, Joint Committee on Physicians' Compensation for Professional Services,* Toronto, March 8, 1982.

3. U.S. Department of Health and Human Services, *Report of the Graduate Medical Education National Advisory Committee to the Secretary,* Vol. I (Hyatteville, MD: DHHS Pub. No. 81-651, 1981).

4. Arthur D. Little Inc., "Projection of Physician Supply and Demand in Ontario to the year 2001", Final Report to the Task Force on Medical Manpower of the Ontario Council of Health, October 1982.

5. A review of the conceptual and practical differences between the two approaches can be found in J. Lomas and G.L. Stoddart "Planning or Simply Supply Projections", Research Paper #1 prepared for the Council of Ontario Universities (Toronto: May 1982).

6. Council of Ontario Universities, "Report of the Task Force on Medical Manpower", Brief to the OCH Task Force on Medical Manpower (Toronto: COU, 1982).

7. National Committee on Physician Manpower, *Report of the Requirements Committee on Physician Manpower* (Ottawa: Health and Welfare Canada, 1975).

8. Population Projections by age groups were prepared by Ontario Ministry of Treasury & Economics based on 1981 census (internal migration is 0.27, migration level is 10,000 and fertility level is low.)

9. Brief to the Task Force on Medical Manpower from the Ontario Chapter, College of Family Physicians of Canada, September 1982, pp. 3–4.

10. Grahame Owen, *The Occupational Content of Family Medicine in Ontario 1982*, (Toronto: Ontario Chapter of College of Family Physicians of Canada, 1982).

11. This assumption is supported by the consultants Arthur D. Little Inc. (p. 44) "We calculate the 'real' age adjusted per capita cost of OHIP-paid health care services in 1980 was virtually the same as it was in 1975. The actual average per capita cost in 1975 was $104.33. After adjusting the 1980 per capita cost of $131.09 for population aging and physician fee inflation, the 1975 equivalent is $105.48.

| *Actual 1980 per capita cost* | *Age adjustment factor* | *Inflation adjustment factor* | *1975 Equivalent per capita cost* |
|---|---|---|---|
| $131.09 | (128.30/131.09) | 116.0/141.1 | = $105.48 |

The age adjustment factor implies that the implicit rate of utilization increase due to aging over the 1974–80 interval was 1.3 percent per year. This is broadly consistent with the 1982 Weiler Report. Weiler found that between 1973–4 and 1981–2 per capita utilization increased by an average annual rate of 1.4 percent per year."

12. The consultants found support for this assumption. They reported (p.44): "Weiler found that after adjusting for inflation the average amount billed per physician was increasing at the rate of 1.9 percent per year. Our results do not support that finding. In 1976 the actual average OHIP billing amount per FTE physician (as defined by the Task Force) was $86,340 and in 1980 it was $104,989. After adjusting the 1980 amount for physician fee inflation, as shown below, we find that 1976 equivalent is nearly the same, equal to $86,313.

| *Billing per FTE Physician in 1980* | *Inflation-Adjustment Factor* | = | *1976 Equivalent* |
|---|---|---|---|
| $104,989 | (116.0/141.1) | | $86,313 |

This calculation suggests that the "real" quantity of services provided per physican has not changed over the 1976–1980 interval.

We believe that the inconsistency between our findings and that of Weiler can be attributed to differences in the definition or measurement of "full-time equivalent" physicians. Weiler essentially considers that only 70 percent of the physicians billing OHIP in each year are working full-time. He computes and compares the billing amounts per physician for those above the 30th percentile in revenue. Inasmuch as our analysis suggests not only that some of those over the 30th percentile are working part-time but also that the proportion working full-time has increased over the past decade, we are not surprised that Weiler's calculation shows an apparent increase in real output per physician. The result appears to be an artifact of Weiler's having used a less precise measure of the full-time equivalent supply."

## Chapter IV — Additional Factors Bearing On Demand

1. John McLaughlin, "The Relationship Between New Health Care Delivery Systems and Physician Productivity," A research report prepared for the OCH Task Force on Medical Manpower, September 1982.

2. H.S. Luft, *Health Maintenance Organizations: Dimensions for Performance*, (New York: Wiley and Sons, 1981).

3. Arthur D. Little Inc., "Projection of Physician Supply and Demand in Ontario to the year 2001," Final report to the Task Force on Medical Manpower of the Ontario Council of Health, October 1982.

4. Uwe E. Reinhardt, *Physician Productivity and the Demand for Health Manpower: An Economic Analysis* (Cambridge: Ballinger, 1975) p. 108.

5. John McLaughlin, "Physician Substitution by Allied Health Personnel," A research report prepared for the OCH Task Force on Medical Manpower, September 1982.

6. Reinhardt, 1975, p. 247.

7. W.O. Spitzer, D.J. Kergin, M.A. Yoshida *et al.* "Nurse Practitioners in Primary Care III: the Southern Ontario Randomized Trial," *C.M.A. Journal* 108 (1973): 1005–1010.

8. Jonathan Lomas and Greg L. Stoddart "Estimates of the Potential Impact of Nurse Practitioners on Future Requirements for General Practitioners," Research Paper #2 prepared for the Council of Ontario Universities (Toronto: May 1982).

9. Ernest Jodoin, "New Technologies", A research report prepared for the Task Force on Medical Manpower, Ontario Council of Health, August 1982.

10. Victor Fuchs, *Determinants of Expenditures for Physicians' Services in the United States*, Discussion Paper No. 117, National Bureau of Economic Research, DHEW Publication No. HSM-73-3013, December 1972.

11. National Committee on Physician Manpower, *Report of the Requirements Committee on Physician Manpower* (Ottawa: Health and Welfare Canada, 1975).

12. Jodoin, 1982, p. 16.

## Chapter V — The Geographic Distribution of Physicians

1. Ernest Jodoin, "Public Perceptions of and Attitudes to Physicians' Services", a paper prepared for the Task Force on Medical Manpower, Ontario Council of Health, August 1982.

2. Mark W. Rosenberg, "The Location of Physicians in Ontario: an analysis", a presentation to the Task Force on Medical Manpower, Ontario Council of Health, August 1982.

3. John M. Garcia, "On Trends in the Equity of Distribution of Physicians in Ontario and Units of Analysis to Gauge the Supply of Physicians in Policy Studies", a paper prepared for the Task Force on Medical Manpower, Ontario Council of Health, October 1982.

4. These components are largely derived from personal communications with Dr. W.J. Copeman, director of the Underserviced Area Program, Ministry of Health, January 1983.

5. William J. Copeman, "Underserviced Area Program: A 10-year Success Story", *Ontario Medical Review* (October 1980): 523.

6. Northwestern Ontario Medical Programme, "Tracking Study of 'NOMP Graduates': Interim Report" (Thunder Bay: NOMP, September 2, 1982).

7. Edward Nowena, Director of Telemedicine Branch of Ministry of Health, Toronto, Ontario, personal communication, December 1982.

## Chapter VI — Re-examination of Postgraduate Medical Education

1. Postgraduate Manpower Committee of Council of Ontario Faculties of Medicine, "Graduate Medical Education: Guidelines for the Resident Establishment" (Toronto: COFM, April 1981).

## TABLE 1

### Physician Payment Thresholds Used to Calculate FTEs/Year

| Year | Payment Threshold |
|---|---|
| 1981-82 | $80,000 |
| 1980-81 | 69,700 |
| 1979-80 | 64,300 |
| 1978-79 | 59,600 |
| 1977-78 | 55,200 |
| 1976-77 | 51,800 |
| 1975-76 | 47,900 |
| 1974-75 | 46,100 |
| 1973-74 | 42,900 |
| 1972-73 | 42,900 |

*Source:*
Physician fee index calculated from the 1982 Weiler report.

## TABLE 2

### FTE Physicians Per Year Providing OHIP Services

| Year | FTE Billing OHIP | Interns and Residents (Intres) | Total FTE (FTE + 0.35 Intres) |
|---|---|---|---|
| 1972–73 | 7558 | 2304 | 8364 |
| 1973–74 | 8042 | 2215 | 8817 |
| 1974–75 | 8532 | 2202 | 9303 |
| 1975–76 | 8949 | 2643 | 9874 |
| 1976–77 | 9162 | 2450 | 10019 |
| 1977–78 | 9393 | 2616 | 10309 |
| 1978–79 | 9594 | 2864 | 10596 |
| 1979–80 | 9749 | 2838 | 10742 |
| 1980–81 | 9992 | 2926 | 11016 |

*Sources:*

*FTE Billing OHIP:*
Calculated from data available through the OHIP Statistical Reporting System.

*Interns and Residents:*
Statistics provided by Provinces to the Health Information Division, Policy, Planning and Information Branch, Department of National Health and Welfare.

## TABLE 3

### Total FTE Physicans Providing Patient Care Services in Fiscal Year 1981

| Category | Number of Physicans |
|---|---|
| FTE Physicians Billing OHIP | 9,992 |
| Psychiatric | 172 |
| HSO | 116 |
| Alternate Payment<br>— Part-time (216 x .5) | 108 |
| Children's Facility | 9 |
| Mental Retardation | 41 |
| Public Health | 55 |
| Public Hospitals | |
| — Full-time | 1,524 |
| — Part-time (2033 x .5) | 1,016 |
| Federal Hospitals | |
| — Full-time | 55 |
| — Part-time (60 x .5) | 30 |
| Interns and Residents<br>(2926 x .35) | 1,024 |
| | 14,142 |

*Source:*
Physician numbers other than OHIP from Data Development and Evaluation Branch, Ontario Ministry of Health. See text for discussion of FTE conversion factors.

## TABLE 4

### Actual Physician Supply, 1972–1980 and Projection of Physician Supply to the Year 2001

| | Beginning of Year | | Additions | | | | | | End of Year | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| Year | No. of Physicians on General Registry | Full-Time Equivalent No. of Physicians Billing OHIP | No. of Graduates | No. of Ontario Graduates Registered | No. of Non-Ontario Graduates Registered | Subtractions (Deaths, Retirement, & Net Emigration) | No. of Physicians on Regular Registry | No. of Physicians on Special Registry | Total Physicians on CPSO Registry | Full-Time Equivalent No. of Physicians Billing OHIP | Population/ CPSO Ratio | Population/ FTE Ratio |
| 1972 | 11,418 | – | 412 | 359 | 665 | 310 | 12,133 | 703 | 12,836 | 8,384 | 609.3 | 935.1 |
| 1973 | 12,133 | 8,364 | 469 | 366 | 423 | 282 | 12,641 | 701 | 13,341 | 8,817 | 594.1 | 899.0 |
| 1974 | 12,641 | 8,817 | 530 | 366 | 417 | 247 | 13,177 | 708 | 13,885 | 9,303 | 580.0 | 805.8 |
| 1975 | 13,177 | 9,303 | 550 | 340 | 364 | 152 | 13,729 | 794 | 14,523 | 9.874 | 562.7 | 827.6 |
| 1976 | 13,729 | 9,874 | 573 | 392 | 342 | 329 | 14,134 | 509 | 14,643 | 10,019 | 564.4 | 824.9 |
| 1977 | 14,134 | 10,019 | 567 | 358 | 329 | 355 | 14,466 | 461 | 14,927 | 10,309 | 559.7 | 810.5 |
| 1978 | 14,466 | 10,309 | 599 | 387 | 274 | 491 | 14,636 | 442 | 15,078 | 10,596 | 560.0 | 796.9 |
| 1979 | 14,636 | 10,596 | 616 | 345 | 292 | 372 | 14,901 | 406 | 15,307 | 10,742 | 555.6 | 791.7 |
| 1980 | 14,901 | 10,742 | 595 | 442 | 389 | 359 | 15,273 | 390 | 15,663 | 11,016 | 546.6 | 777.4 |
| 1981 | 15,273 | 11,016 | 615 | 472 | 258 | 429 | 15,575 | 417 | 15,992 | 11,297 | 539.3 | 763.5 |
| 1982 | 15,575 | 11,297 | 622 | 478 | 212 | 438 | 15,826 | 395 | 16,221 | 11,522 | 353.8 | 754.3 |
| 1983 | 15,826 | 11,522 | 628 | 482 | 171 | 444 | 16,035 | 373 | 16,409 | 11,714 | 533.7 | 747.6 |
| 1984 | 16,035 | 11,714 | 634 | 487 | 150 | 450 | 16,223 | 352 | 16,575 | 11,888 | 532.3 | 742.2 |
| 1985 | 16,223 | 11,888 | 639 | 490 | 138 | 454 | 16,397 | 332 | 16,729 | 12,051 | 531.3 | 737.6 |
| 1986 | 16,397 | 12,051 | 643 | 494 | 130 | 458 | 16,562 | 313 | 16,875 | 12,204 | 530.7 | 733.8 |
| 1987 | 16,562 | 12,204 | 646 | 496 | 124 | 462 | 16,720 | 295 | 17,015 | 12,351 | 529.5 | 729.5 |
| 1988 | 16,720 | 12,351 | 648 | 498 | 116 | 466 | 16,868 | 277 | 17,145 | 12,490 | 528.7 | 725.8 |
| 1989 | 16,868 | 12,490 | 651 | 500 | 109 | 470 | 17,007 | 260 | 17,266 | 12,620 | 528.2 | 722.7 |
| 1990 | 17,007 | 12,620 | 652 | 501 | 104 | 473 | 17,138 | 243 | 17,382 | 12,744 | 527.9 | 720.0 |
| 1991 | 17,138 | 12,744 | 654 | 502 | 101 | 476 | 17,265 | 227 | 17,492 | 12,864 | 527.7 | 717.6 |
| 1992 | 17,265 | 12,864 | 654 | 502 | 99 | 479 | 17,387 | 212 | 17,598 | 12,978 | 526.7 | 714.2 |
| 1993 | 17,387 | 12,978 | 653 | 502 | 91 | 482 | 17,497 | 197 | 17,694 | 13,084 | 526.0 | 711.4 |
| 1994 | 17,497 | 13,084 | 653 | 501 | 84 | 485 | 17,598 | 182 | 17,780 | 13,182 | 525.6 | 709.0 |
| 1995 | 17,598 | 13,182 | 652 | 501 | 79 | 487 | 17,691 | 168 | 17,859 | 13,273 | 525.5 | 707.1 |
| 1996 | 17,691 | 13,272 | 651 | 500 | 77 | 489 | 17,778 | 154 | 17,932 | 13,359 | 525.5 | 705.4 |
| 1997 | 17,778 | 13,359 | 648 | 498 | 76 | 491 | 17,861 | 140 | 18,001 | 13,441 | 524.7 | 702.7 |
| 1998 | 17,861 | 13,441 | 646 | 496 | 69 | 493 | 17,933 | 127 | 18,060 | 13,514 | 524.2 | 700.5 |
| 1999 | 17,933 | 13,514 | 643 | 494 | 63 | 495 | 17,995 | 114 | 18,109 | 13,579 | 524.0 | 698.8 |
| 2000 | 17,995 | 13,579 | 640 | 491 | 60 | 496 | 18,050 | 102 | 18,152 | 13,639 | 524.0 | 697.3 |
| 2001 | 18,050 | 13,639 | 636 | 488 | 58 | 497 | 18,100 | 89 | 18,189 | 13,693 | 523.6 | 695.5 |

*Source:*

Arthur D. Little Inc. "Projection of Physician Supply & Demand in Ontario to the Year 2001," Report to the Task Force on Medical Manpower, Ontario Council of Health, 1982.

## TABLE 5

### Projection of Physician Supply to the Year 2001
### Assuming That the Number of Graduates from Ontario Medical Schools Remains Constant at 606

| Beginning of Year | | | Additions | | | Subtractions | End of Year | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | General | FTE | Grads | Lic. | Immig. | | General | Special | CPSO | FTE | POP/CPSO | POP/FTE |
| 1981 | 15273 | 11016 | 606 | 465 | 258 | 429 | 15568 | 417 | 15985 | 11292 | 539.6 | 763.8 |
| 1982 | 15568 | 11292 | 606 | 465 | 212 | 438 | 15807 | 395 | 16202 | 11508 | 536.4 | 755.2 |
| 1983 | 15807 | 11508 | 606 | 465 | 173 | 444 | 16001 | 373 | 16374 | 11689 | 534.8 | 749.2 |
| 1984 | 16001 | 11689 | 606 | 465 | 155 | 449 | 16173 | 351 | 16524 | 11851 | 534.0 | 744.5 |
| 1985 | 16173 | 11851 | 606 | 465 | 145 | 453 | 16330 | 331 | 16661 | 12001 | 533.5 | 740.7 |
| 1986 | 16330 | 12001 | 606 | 465 | 141 | 457 | 16480 | 311 | 16791 | 12144 | 533.3 | 737.4 |
| 1987 | 16480 | 12144 | 606 | 465 | 139 | 460 | 16624 | 293 | 16917 | 12280 | 532.6 | 733.7 |
| 1988 | 16624 | 12280 | 606 | 465 | 134 | 464 | 16759 | 275 | 17034 | 12409 | 532.2 | 730.5 |
| 1989 | 16759 | 12409 | 606 | 465 | 130 | 467 | 16888 | 258 | 17146 | 12532 | 531.9 | 727.8 |
| 1990 | 16888 | 12532 | 606 | 465 | 127 | 470 | 17011 | 241 | 17252 | 12649 | 531.9 | 725.4 |
| 1991 | 17011 | 12649 | 606 | 465 | 126 | 473 | 17130 | 225 | 17355 | 12763 | 531.9 | 723.2 |
| 1992 | 17130 | 12763 | 606 | 465 | 126 | 476 | 17246 | 210 | 17456 | 12873 | 531.0 | 720.0 |
| 1993 | 17246 | 12873 | 606 | 465 | 120 | 478 | 17353 | 195 | 17548 | 12977 | 530.4 | 717.3 |
| 1994 | 17353 | 12977 | 606 | 465 | 115 | 481 | 17453 | 181 | 17633 | 13073 | 530.0 | 714.9 |
| 1995 | 17453 | 13073 | 606 | 465 | 111 | 483 | 17546 | 166 | 17712 | 13164 | 529.8 | 712.9 |
| 1996 | 17546 | 13164 | 606 | 465 | 109 | 485 | 17634 | 153 | 17787 | 13251 | 529.8 | 711.1 |
| 1997 | 17634 | 13251 | 606 | 465 | 108 | 487 | 17720 | 139 | 17859 | 13335 | 528.8 | 708.3 |
| 1998 | 17720 | 13335 | 606 | 465 | 101 | 489 | 17797 | 126 | 17923 | 13411 | 528.2 | 705.9 |
| 1999 | 17797 | 13411 | 606 | 465 | 94 | 491 | 17865 | 113 | 17979 | 13481 | 527.6 | 703.8 |
| 2000 | 17865 | 13481 | 606 | 465 | 90 | 493 | 17928 | 101 | 18029 | 13546 | 527.5 | 702.1 |
| 2001 | 17928 | 13546 | 606 | 465 | 87 | 494 | 17986 | 89 | 18075 | 13608 | 526.9 | 699.9 |

*Source:*
Arthur D. Little Inc. "Projection of Physician Supply & Demand in Ontario to the Year 2001," Report to the Task Force on Medical Manpower, Ontario Council of Health, 1982.

## TABLE 6

### Projection of Physician Supply to the Year 2001
### Assuming a 15 Percent Reduction in Output of Ontario Medical Schools

| Beginning of Year | | | Additions | | | Subtractions | End of Year | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | General | FTE | Grads | Lic. | Immig. | | General | Special | CPSO | FTE | POP/CPSO | POP/FTE |
| 1981 | 15273 | 11016 | 515 | 396 | 258 | 429 | 15498 | 415 | 15913 | 11241 | 542.0 | 767.3 |
| 1982 | 15498 | 11241 | 515 | 396 | 212 | 436 | 15669 | 391 | 16060 | 11408 | 541.2 | 761.8 |
| 1983 | 15669 | 11408 | 515 | 396 | 187 | 440 | 15812 | 368 | 16180 | 11551 | 541.2 | 758.1 |
| 1984 | 15812 | 11551 | 515 | 396 | 183 | 443 | 15948 | 346 | 16294 | 11687 | 541.5 | 755.0 |
| 1985 | 15948 | 11687 | 515 | 396 | 185 | 446 | 16082 | 326 | 16408 | 11819 | 541.8 | 752.1 |
| 1986 | 16082 | 11819 | 515 | 396 | 188 | 450 | 16216 | 306 | 16522 | 11949 | 542.0 | 749.4 |
| 1987 | 16216 | 11949 | 515 | 396 | 191 | 453 | 16349 | 288 | 16637 | 12078 | 541.6 | 746.0 |
| 1988 | 16349 | 12078 | 515 | 396 | 189 | 456 | 16478 | 270 | 16749 | 12201 | 541.2 | 743.0 |
| 1989 | 16478 | 12201 | 515 | 396 | 188 | 459 | 16602 | 254 | 16856 | 12320 | 541.1 | 740.3 |
| 1990 | 16602 | 12320 | 515 | 396 | 187 | 462 | 16723 | 237 | 16960 | 12435 | 541.0 | 737.9 |
| 1991 | 16723 | 12435 | 515 | 396 | 187 | 465 | 16840 | 222 | 17062 | 12547 | 541.0 | 735.7 |
| 1992 | 16840 | 12547 | 515 | 396 | 187 | 467 | 16955 | 206 | 17161 | 12656 | 540.1 | 732.4 |
| 1993 | 16955 | 12656 | 515 | 396 | 181 | 470 | 17062 | 192 | 17254 | 12758 | 539.5 | 729.5 |
| 1994 | 17062 | 12758 | 515 | 396 | 176 | 473 | 17161 | 177 | 17338 | 12854 | 539.0 | 727.1 |
| 1995 | 17161 | 12854 | 515 | 396 | 173 | 475 | 17254 | 164 | 17417 | 12945 | 538.8 | 725.0 |
| 1996 | 17254 | 12945 | 515 | 396 | 171 | 477 | 17343 | 150 | 17493 | 13031 | 538.7 | 723.1 |
| 1997 | 17343 | 13031 | 515 | 396 | 170 | 479 | 17428 | 137 | 17565 | 13115 | 537.7 | 720.1 |
| 1998 | 17428 | 13115 | 515 | 396 | 163 | 481 | 17505 | 124 | 17630 | 13192 | 537.0 | 717.6 |
| 1999 | 17505 | 13192 | 515 | 396 | 157 | 483 | 17574 | 112 | 17686 | 13262 | 536.5 | 715.5 |
| 2000 | 17574 | 13262 | 515 | 396 | 152 | 485 | 17637 | 99 | 17737 | 13327 | 536.2 | 713.7 |
| 2001 | 17637 | 13327 | 515 | 396 | 149 | 486 | 17696 | 87 | 17783 | 13388 | 535.5 | 711.4 |

*Source:*
Arthur D. Little Inc. "Projection of Physician Supply & Demand in Ontario to the Year 2001," Report to the Task Force on Medical Manpower, Ontario Council of Health, 1982.

## TABLE 7

### Projection of Physician Supply to the Year 2001
### Using Phase I Immigration Assumptions

| Beginning of Year | | | Additions | | | Subtractions | End of Year | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | General | FTE | Grads | Lic. | Immig. | | General | Special | CPSO | FTE | POP/CPSO | POP/FTE |
| 1981 | 15273 | 11016 | 615 | 472 | 275 | 429 | 15591 | 418 | 16009 | 11309 | 538.8 | 762.7 |
| 1982 | 15591 | 11309 | 622 | 478 | 275 | 439 | 15905 | 397 | 16302 | 11580 | 533.1 | 750.5 |
| 1983 | 15905 | 11580 | 628 | 482 | 275 | 447 | 16216 | 378 | 16594 | 11846 | 527.7 | 739.2 |
| 1984 | 16216 | 11846 | 634 | 487 | 275 | 455 | 16523 | 359 | 16882 | 12108 | 522.6 | 728.7 |
| 1985 | 16523 | 12108 | 639 | 490 | 275 | 463 | 16826 | 341 | 17167 | 12366 | 517.8 | 718.8 |
| 1986 | 16826 | 12366 | 643 | 494 | 185 | 470 | 17034 | 322 | 17356 | 12552 | 516.0 | 713.4 |
| 1987 | 17034 | 12552 | 646 | 496 | 185 | 476 | 17240 | 304 | 17544 | 12735 | 513.6 | 707.5 |
| 1988 | 17240 | 12735 | 648 | 498 | 185 | 481 | 17442 | 286 | 17728 | 12915 | 511.3 | 701.9 |
| 1989 | 17442 | 12915 | 651 | 500 | 185 | 486 | 17641 | 269 | 17910 | 13091 | 509.2 | 696.7 |
| 1990 | 17641 | 13091 | 652 | 501 | 185 | 491 | 17836 | 253 | 18089 | 13263 | 507.2 | 691.8 |
| 1991 | 17836 | 13263 | 654 | 502 | 185 | 496 | 18028 | 237 | 18265 | 13432 | 505.4 | 687.2 |
| 1992 | 18028 | 13432 | 654 | 502 | 185 | 500 | 18214 | 222 | 18436 | 13596 | 502.8 | 681.7 |
| 1993 | 18214 | 13596 | 653 | 502 | 185 | 505 | 18396 | 207 | 18603 | 13756 | 500.3 | 676.6 |
| 1994 | 18396 | 13756 | 653 | 501 | 185 | 510 | 18573 | 192 | 18765 | 13912 | 498.1 | 671.8 |
| 1995 | 18573 | 13912 | 652 | 501 | 185 | 514 | 18744 | 178 | 18922 | 14063 | 496.0 | 667.3 |
| 1996 | 18744 | 14063 | 651 | 500 | 185 | 518 | 18911 | 164 | 19074 | 14210 | 494.0 | 663.1 |
| 1997 | 18911 | 14210 | 648 | 498 | 185 | 523 | 19071 | 150 | 19221 | 14351 | 491.4 | 658.1 |
| 1998 | 19071 | 14351 | 646 | 496 | 185 | 527 | 19225 | 136 | 19361 | 14488 | 489.0 | 653.4 |
| 1999 | 19225 | 14488 | 643 | 494 | 185 | 530 | 19373 | 123 | 19496 | 14619 | 486.7 | 649.1 |
| 2000 | 19373 | 14619 | 640 | 491 | 185 | 534 | 19515 | 110 | 19825 | 14746 | 484.6 | 645.0 |
| 2001 | 19515 | 14746 | 636 | 488 | 185 | 538 | 19651 | 97 | 19748 | 14867 | 482.3 | 640.6 |

*Source:*
Arthur D. Little Inc. "Projection of Physician Supply & Demand in Ontario to the Year 2001," Report to the Task Force on Medical Manpower, Ontario Council of Health, 1982.

# TABLE 8

## Projection of Physician Supply to the Year 2001
## Assuming Ontario Physicians' Fees are Maintained at the Level of the National Average

| Beginning of Year | | | Additions | | | Subtractions | End of Year | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | General | FTE | Grads | Lic. | Immig. | | General | Special | CPSO | FTE | POP/CPSO | POP/FTE |
| 1981 | 15273 | 11016 | 615 | 472 | 258 | 329 | 15675 | 420 | 16095 | 11370 | 535.9 | 758.6 |
| 1982 | 15675 | 11370 | 622 | 478 | 212 | 338 | 16027 | 400 | 16427 | 11668 | 529.1 | 744.9 |
| 1983 | 16027 | 11668 | 628 | 482 | 150 | 345 | 16314 | 380 | 16694 | 11918 | 524.6 | 734.8 |
| 1984 | 16314 | 11918 | 634 | 487 | 107 | 351 | 16558 | 360 | 16917 | 12133 | 521.5 | 727.2 |
| 1985 | 16554 | 12133 | 639 | 490 | 77 | 355 | 16770 | 340 | 17110 | 12324 | 519.5 | 721.2 |
| 1986 | 16770 | 12324 | 643 | 494 | 56 | 359 | 16961 | 321 | 17281 | 12498 | 518.2 | 716.5 |
| 1987 | 16961 | 12498 | 646 | 496 | 42 | 363 | 17136 | 302 | 17438 | 12659 | 516.7 | 711.8 |
| 1988 | 17136 | 12659 | 648 | 498 | 28 | 366 | 17295 | 284 | 17579 | 12806 | 515.7 | 707.9 |
| 1989 | 17295 | 12806 | 651 | 500 | 16 | 369 | 17442 | 266 | 17708 | 12943 | 515.0 | 704.6 |
| 1990 | 17442 | 12943 | 652 | 501 | 9 | 372 | 17580 | 249 | 17829 | 13073 | 514.6 | 701.9 |
| 1991 | 17580 | 13073 | 654 | 502 | 3 | 374 | 17711 | 233 | 17944 | 13196 | 514.4 | 699.5 |
| 1992 | 17711 | 13196 | 654 | 502 | 0 | 377 | 17836 | 217 | 18054 | 13314 | 513.4 | 696.2 |
| 1993 | 17836 | 13314 | 653 | 502 | 0 | 379 | 17959 | 202 | 18161 | 13429 | 512.5 | 693.1 |
| 1994 | 17959 | 13429 | 653 | 501 | 0 | 381 | 18079 | 187 | 18266 | 13542 | 511.7 | 690.1 |
| 1995 | 18079 | 13542 | 652 | 501 | 0 | 384 | 18196 | 173 | 18369 | 13652 | 510.9 | 687.4 |
| 1996 | 18196 | 13652 | 651 | 500 | 0 | 386 | 18310 | 158 | 18469 | 13758 | 510.2 | 684.9 |
| 1997 | 18310 | 13758 | 648 | 498 | 0 | 388 | 18420 | 145 | 18565 | 13862 | 508.7 | 681.4 |
| 1998 | 18420 | 13862 | 646 | 496 | 0 | 390 | 18526 | 131 | 18658 | 13961 | 507.4 | 678.1 |
| 1999 | 18526 | 13961 | 643 | 494 | 0 | 392 | 18628 | 118 | 18746 | 14057 | 506.4 | 675.0 |
| 2000 | 18628 | 14057 | 640 | 491 | 0 | 394 | 18726 | 106 | 18831 | 14149 | 505.1 | 672.2 |
| 2001 | 18726 | 14149 | 636 | 488 | 0 | 395 | 18819 | 93 | 18912 | 14238 | 503.6 | 668.9 |

*Source:*
Arthur D. Little Inc. "Projection of Physician Supply & Demand in Ontario to the Year 2001," Report to the Task Force on Medical Manpower, Ontario Council of Health, 1982.

# TABLE 9

## Population Per FTE Physician
## Under Various Assumptions

| Assumption | Population/FTE Physician |
|---|---|
| Actual, 1980 | 777.4 |
| Projected 2001 | |
| Base Model | 695.5 |
| Medical school graduates constant, 606/year | 699.9 |
| Medical school graduates reduced by 15% (515) | 711.4 |
| Immigration constant at 275/year till 1985; 185/year thereafter | 640.6 |
| Increase in OHIP fees to national average | 668.9 |

## TABLE 10

## The Actual Average Physician Workload, In Hours Per Year, Ontario, 1980

| Specialty | Number of Physicians Billing OHIP | Actual Number of Hours Worked Per Year | Total |
|---|---|---|---|
| General Practice | 6730 | 2544 | 17,121,120 |
| Anesthesia | 541 | 2585 | 1,398,485 |
| Dermatology | 138 | 2208 | 304,704 |
| General Surgery | 690 | 2832 | 1,954,080 |
| Neurosurgery | 53 | 3168 | 167,904 |
| Orthopedic Surgery | 259 | 2784 | 721,056 |
| Plastic Surgery | 89 | 2688 | 239,232 |
| Thoracic-Card. Surgery | 33 | 2914 | 96,162 |
| Internal Medicine | 1134 | 2688 | 3,048,192 |
| Neurology | 105 | 2784 | 292,320 |
| Psychiatry | 855 | 2350 | 2,009,250 |
| Ob/Gyn | 533 | 2640 | 1,407,120 |
| Ophthalmology | 291 | 2482 | 722,262 |
| Otolaryngology | 201 | 2303 | 462,903 |
| Pediatrics | 471 | 2496 | 1,175,616 |
| Pathology | — | NA | — |
| Physical Medicine | 53 | 2397 | 127,041 |
| Diagnostic Radiology | 423 | 2401 | 1,015,623 |
| Therapeutic Radiology | — | NA | — |
| Urology | 154 | 2928 | 450,912 |
| Sum/Weighted Average | 12,753 | 2565 | 32,713,982 |

*Data Sources:*

Number of physicians billing OHIP — OHIP, 1980; actual number of hours worked per year — Erin Holmes, "O.M.A. Income Survey: No Surprises in 1980," Ontario Medical Association, June 1982.

## TABLE 11

### Calculations for Weighted Average Utilization Costs Per Person By Age Groups For Projected Population — 1991 & 2001

| | 1991 | | | 2001 | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (1) | (2) | (3) |
| Age Group | Population Projection[1] | Utilization Costs Per Person in 1980[2] | Total (1) x (2) | Population Projection[1] | Utilization Costs Per Person in 1980[1] | Total (1) x (2) |
| 0–4 | 580,743 | $101.28 | 58,817,651.04 | 491,148 | $101.28 | 49,743,469.44 |
| 5–9 | 599,262 | 67.39 | 40,384,266.10 | 537,826 | 67.39 | 36,244,094.14 |
| 10–14 | 599,352 | 55.28 | 33,132,178.56 | 586,368 | 55.28 | 32,414,423.04 |
| 15–19 | 614,087 | 77.08 | 47,333,825.96 | 604,100 | 77.08 | 46,564,028.00 |
| 20–24 | 677,076 | 103.14 | 69,833,618.64 | 606,291 | 103.14 | 62,532,853.74 |
| 25–29 | 810,949 | 124.33 | 100,825,289.20 | 626,456 | 124.33 | 77,887,274.48 |
| 30–34 | 822,356 | 126.09 | 103,690,868.00 | 688,500 | 126.09 | 86,812,965.00 |
| 35–39 | 755,009 | 119.95 | 90,563,329.55 | 814,190 | 119.95 | 97,662,090.50 |
| 40–44 | 715,824 | 120.25 | 86,077,836.00 | 817,050 | 120.25 | 98,250,262.50 |
| 45–49 | 577,910 | 127.36 | 73,602,617.60 | 742,340 | 127.36 | 94,544,422.40 |
| 50–54 | 473,403 | 140.40 | 66,465,781.20 | 693,506 | 140.40 | 97,368,242.40 |
| 55–59 | 444,720 | 153.95 | 68,464,644.00 | 547,883 | 153.95 | 84,346,587.85 |
| 60–64 | 423,582 | 171.74 | 72,745,972.68 | 434,376 | 171.74 | 74,599,734.24 |
| 65–69 | 391,822 | 192.02 | 75,237,660.44 | 388,225 | 192.02 | 74,546,964.50 |
| 70–74 | 282,920 | 212.08 | 60,001,673.60 | 342,673 | 212.08 | 72,674,089.84 |
| 75–79 | 214,569 | 233.95 | 50,198,417.55 | 284,436 | 233.95 | 66,543,802.20 |
| 80–84 | 138,175 | 256.19 | 35,399,053.25 | 174,924 | 256.19 | 44,813,779.56 |
| 85+ | 108,866 | 283.63 | 30,877,663.58 | 152,643 | 283.63 | 43,294,134.09 |
| Sum/Weighted Average | 9,230,625 | $126.06 | 1,163,652,347.00 | 9,532,935 | $130.16 | 1,240,843,218.00 |

$$\text{Weighted Average Utilization Costs per Person} = \frac{\text{Sum of (3)}}{\text{Sum of (1)}}$$

[1] Population projections from *STATS, CANADA,* 1982

[2] 1980 Utilization costs per person from Ontario Ministry of Health, OHIP Statistical Reporting System, Physician/Practitioner Activity by Age/Sex Distribution of Patients (per capita cost), 1980.

## TABLE 12

## Calculations For The Physician Efficiency Factors

### A. Assuming Relative Female Productivity is Constant

| Year | Female Efficiency Factor | | Proportion Female | | Male Efficiency Factor | | Proportion Male | | Efficiency Factor |
|---|---|---|---|---|---|---|---|---|---|
| 1980 | 0.75[1] | * | 0.128 | + | 1.00 | * | 0.872 | = | 0.968 |
| 1991 | 0.75 | * | 0.207 | + | 1.00 | * | 0.793 | = | 0.948 |
| 2001 | 0.75 | * | 0.246 | + | 1.00 | * | 0.754 | = | 0.938 |

### B. Assuming Male and Female Productivity Coverage

| Year | Female Efficiency Factor | | Proportion Female | | Male Efficiency Factor | | Proportion Male | | Efficiency Factor |
|---|---|---|---|---|---|---|---|---|---|
| 1980 | 0.75 | * | 0.128 | + | 1.00 | * | 0.872 | = | 0.968 |
| 1991 | 0.875 | * | 0.207 | + | 1.00 | * | 0.793 | = | 0.974 |
| 2001 | 1.00 | * | 0.246 | + | 1.00 | * | 0.754 | = | 1.00 |

[1] Both the 1980 Manpower Survey of the Study Group for Family Medicine in Ontario and a recent survey conducted by the College of Family Physicians of Canada found that female physicians in Ontario average 75 percent as many hours as male physicians.

*Source:*
Arthur D. Little Inc. "Projections of Physician Supply & Demand in Ontario to the Year 2001," Report to the Task Force on Medical Manpower, Ontario Council of Health, 1982.

## TABLE 13

### The Estimated Physician Requirements in 1991 and 2001

**A. Assuming Relative Female Productivity is Constant**

| | | | Estimated 1981 Requirement | | Female Productivity Adjustment | | Population Adjustment | | Age Adjustment | | Hours-Worked Adjustment[1] | | Estimated Future Requirements |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1991 | $FTE_{REQ}$ | = | 10,741 physicians | * | (0.968/0.948) | * | (9,230,625/8,503,700) | * | (126.06/119.16) | * | (2,565/2,404) | = | 13,439 |
| 2001 | $FTE_{REQ}$ | = | 10,742 physicians | * | (0.968/0.938) | * | (9,532,935/8,503,700) | * | (130.16/119.16) | * | (2,565/2,243) | = | 15,529 |

**B. Assuming Productivity Converges**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1991 | $FTE_{REQ}$ | = | 10,742 physicians | * | (0.968/0.974) | * | (9,230,625/8,503,700) | * | (126.06/119.16) | * | (2,565/2,404) | = | 13,081 |
| 2001 | $FTE_{REQ}$ | = | 10,742 physicians | * | (0.968/1.000) | * | (9,532,935/8,503,700) | * | (130.16/119.16) | * | (2,565/2,243) | = | 14,565 |

[1] Assumes that only half of the difference between actual and optimum is eliminated by 1991.

*Source:*

Arthur D. Little Inc. "Projections of Physician Supply & Demand in Ontario to the Year 2001," Report to the Task Force on Medical Manpower, Ontario Council of Health, 1982.

## TABLE 14

### The Number of Physicians Required In Ontario Using the Michigan Model, 1981

| Community Size | Population | Physician-to-Population Ratio | Number of Physicians |
|---|---|---|---|
| 50,000 or more | 4,808,315 | 95 per 100,000 | 4,568 |
| 20,000–50,000[1] | 899,648 | 106.4 per 100,000[1] | 957 |
| <20,000[2] | 2,517,137 | 119.2 per 100,000[2] | 3,000 |
| Underserved[3] | 400,000 | 250 per 100,000[3] | 1,000 |
| | | | 9,525 |
| **Age Adjustment**<br>9,525 x 1.044 = | | | 9,944 |
| **Out-of-Plan Adjustment**[4]<br>9,944 x 1.10 = | | | 10,938 |
| **Institutional Requirements** | | | |
| • Psychiatric hospitals | | 172 | |
| • Children's facilities | | 9 | |
| • Mental retardation | | 41 | |
| • Public health | | 55 | |
| | | | 277 |
| | | | 11,215 |

[1] The Michigan study concludes that medium-size HMOs have a 12 percent greater staffing ratio, but arbitrarily reduces the adjustment to six percent. We use a 12 percent factor.

[2] Staffing ratio assumed to be 12 percent greater than for medium-size HMOs.

[3] Uses approximate actual physician-to-population ratio.

[4] Follows the assumption made in the Michigan report, namely, that HMO members receive 10 percent of health care services from other sources.

*Sources:*

Population by community size from Canada Ministry of Supply and Services, "1981 Census of Canada: Census Subdivisions in Decreasing Population Order," May 1982.

Institutional requirements from Data Development and Evaluation Branch, Ontario Ministry of Health. Age adjustment factor developed in Table 14.

## TABLE 15

### Estimates of Potential Reductions in Physicians With a 20 Year Gradual Introduction of Nurse Practitioners 1981-2001

| Year | % of NP Technology Introduced | Manpower Reductions | | | |
|---|---|---|---|---|---|
| | | Low Estimates | | High Estimates | |
| | | % of GPs | No. of GPs* | % of GPs | No. of GPs* |
| 1981 | 0 | 0 | 0 | 0 | 0 |
| 1986 | 15 | 3.04 | 165 | 4.86 | 264 |
| 1991 | 50 | 10.14 | 576 | 16.21 | 921 |
| 1996 | 85 | 17.23 | 1012 | 27.58 | 1567 |
| 2001 | 100 | 20.27 | 1220 | 32.47 | 1957 |

*This assumes a yearly percentage increase in the number of full-time equivalent GPs that is the same as the yearly percentage increase in the total population estimate (Statistics Canada), with 5,122.9 full-time equivalents in the base year of 1980.

*Source:*
Lomas and Stoddart, "Estimates of the Potential Impact of Nurse Practitioners on Future Requirements for General Practitioners," Research Paper No. 2 prepared for the Council of Ontario Univerisities (Toronto, May 1982), p. 18.

## TABLE 16

### Population Per Physician in Canada and A Selection of Western Countries

| Country | Year | Population/Physician |
|---|---|---|
| Canada | 1978 | 666 |
| Newfoundand | 1978 | 888 |
| Prince Edward Island | 1978 | 857 |
| Nova Scotia | 1978 | 674 |
| New Brunswick | 1978 | 960 |
| Quebec | 1978 | 650 |
| Ontario | 1978 | 644 |
| Manitoba | 1978 | 680 |
| Saskatchewan | 1978 | 789 |
| Alberta | 1978 | 758 |
| British Columbia | 1978 | 579 |
| United States | 1978 | 594 |
| U.K. — England & Wales | 1978 | 842 |
| Sweden | 1973 | 645 |
| West Germany | 1975 | 421 |
| France | 1976 | 613* |

*Source:*
J. Lomas and G.L. Stoddart, "Planning or Simply Supply Projections", Research Paper No. 1 prepared for the Council of Ontario Universities, May 1982, Table 7, p. 42.

*Source is World Health Statistics Annual-Health Personnel & Hospital Establishment

## TABLE 17
## Population Per Physician By County and Region in Ontario in 1980

| Region | County/District | Population per Physician in 1980* |
|---|---|---|
| Southwest | Bruce | 1,201 |
| | Elgin | 837 |
| | Essex | 794 |
| | Grey | 647 |
| | Huron | 1,121 |
| | Kent | 881 |
| | Lambton | 834 |
| | Middlesex | 330 |
| | Oxford | 881 |
| | Perth | 749 |
| | **Region** | **[illegible]** |
| Central West | Brant | 753 |
| | Dufferin | 1,069 |
| | Haldimand/Norfolk | 1,575 |
| | Halton RM | 581 |
| | Niagara RM | 792 |
| | Waterloo RM | 771 |
| | Wellington | 724 |
| | Hamilton/Wentworth RM | 459 |
| | **Region** | **663** |
| Central East | Haliburton | 1,114 |
| | Metro Toronto | 380 |
| | Muskoka | 669 |
| | Northumberland | 999 |
| | Durham RM | 819 |
| | Peel RM | 929 |
| | Peterborough | 519 |
| | Simcoe | 757 |
| | Victoria | 951 |
| | York RM | 685 |
| | **Region** | **481** |
| Eastern | Frontenac | 280 |
| | Hastings | 650 |
| | Lanark | 708 |
| | Leeds/Grenville | 724 |
| | Lennox & Addington | 1,163 |
| | Ottawa-Carleton RM | 373 |
| | Prescott & Russell | 1,116 |
| | Prince Edward | 885 |
| | Renfrew | 875 |
| | Stormont/Dundas/Glen. | 915 |
| | **Region** | **471** |
| North East | Algoma | 868 |
| | Cochrane | 974 |
| | Manitoulin | 793 |
| | Nipissing | 765 |
| | Parry Sound | 745 |
| | Sudbury (RM & District) | 845 |
| | Timiskaming | 894 |
| | **Region** | **866** |
| North West | Kenora | 1,318 |
| | Rainy River | 1,219 |
| | Thunder Bay | 786 |
| | **Region** | **910** |

*Obtained by using December 31st, 1980 physician figures from CPSO with June 1980 county population estimates. Source is *Ontario Statistics 1981*, p. 125.

## TABLE 18

### The Effect of the Size of the Ministry of Health Funded Postgraduate Training Establishment in Ontario on the Supply of Physicians in 2001 as if All Postgraduate Trainees Settled in Ontario and there Was No Immigration or Emigration of Physicians

| Calculation | Full Implementation of Proposed Reductions by 1985[1] | Implementation of Reductions to 1983 |
|---|---|---|
| 1. Size of Postgraduate Establishment in 1985 | 2077 | 2327 |
| minus | | |
| 2. Number of Interns (659) | 1418 | 1668 |
| minus | | |
| 3. Obligations to Other Provinces (119) | 1299 | 1549 |
| times | | |
| 4. Annual physician output the PG establishment produces[2] (652/1880) | 450 | 537 |
| times | | |
| 5. Conversion factor to full-time equivalents[3] for 1980 (11,016/15,663 = 0.7) | 315 | 376 |
| plus | | |
| 6. Assumption that 70 interns go directly into practice[4] | 385 | 446 |
| minus | | |
| 7. Number lost to attrition[5] (FTE 1980 x 2.74% = 302) | 83 | 144 |
| equals | | |
| **8. Annual additions to Physician Supply** | **83** | **144** |
| times | | |
| 9. 16 years (2001–1985) | 1328 | 2304 |
| plus | | |
| 10. Number of Physicians added between 1981 and 1984[6] | 1946 | 2952 |
| plus | | |
| 11. Number of FTE Physicians in 1980 (11,016 — See Table 4) | 12,962 | 13,968 |
| equals | | |
| **12. Number of FTE Physicians supplied in 2001** | **12,962** | **13,968** |

*Notes to Table 18*

1. These figures do not take account of the reinstatement in 1983 of 125 positions designated as lost. If the 125 places were added throughout the period 1983 to 2001, the addition to the total number of FTE physicians in 2001 would be 540.

2. Allowing for the minimum requirements for certification, the attrition from the program and the supplementary training required beyond minimum requirements, the Low Committee calculated that a total establishment of 1880 is required for an annual output of 652 physicians.

3. The conversion factor to full-time equivalents is based on the 1980 ratio between full-time equivalents (as defined by this Task Force and discussed in Chapter III) and the number of physicians on the CPSO register. This component of the calculation is a small source of error because the FTE/CPSO ratio is not projected to remain constant over time (see Table 4). In addition it may be that the proportion of the time of recent graduates amounting to full-time equivalents is different than the proportion for the total registry. Perhaps a larger percentage of recent graduates are engaged in full-time practice but this might be offset by lower productivity in the early years of practice. Thus the use of 0.7 as a conversion factor represents only a reasonable approximation.

4. The number of interns going directly into practice after one year of a rotating or mixed internship is unknown but the number is getting smaller. An average of 70 per year (about 10% of the total number of internships) is assumed.

5. The number lost to attrition is 2.74% of the number of FTE physicians in 1980. This does not take into account the slight attrition among additions between 1985 and 2001.

6. The number of physicians added to the supply between 1981 and 1984 differs depending on whether all the proposed reductions in the postgraduate establishment are made. Using the same calculations (steps 1–8 in Table 19), the annual additions to supply were calculated for each year between 1981 and 1984.

| Year | Postgraduate Establishment* | No. Additions for full implementation of reductions | No. Additions for partial implementation of reductions |
|---|---|---|---|
| 1981 | 2502 | 186 | 186 |
| 1982 | 2452 | 174 | 174 |
| 1983 | 2327 | 144 | 144 |
| 1984 | 2202 | 114 | 144 |
| Total | — | 618 | 648 |

*These are the Minister's proposed reductions to the postgraduate establishment.

Appendix 1

# Members of the Task Force, Staff and Consultants

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**Chairman:**

J.B. Macdonald, M.S., Ph.D., LLD., D.Sc.
Chairman, Addiction Research Foundation, Toronto
Vice-Chairman, Ontario Council of Health

**Members:**

A.N. Bourns, O.C., B.Sc., Ph.D., D.Sc., LLD., F.R.S.C.
Hamilton

E. Cruickshank, R.N., B.N., M.Sc.
Lecturer, Faculty of Nursing, University of Western Ontario, London
Associate Consultant, Woods, Gordon

H.C. Eastman, Ph.D., F.R.S.C.
Department of Economics,
University of Toronto

D.J. Grant, B.Sc., M.D., C.R.C.P. (C) (Dermatology)
Kitchener
Member, Ontario Council of Health

R.B. Holmes, M.D., M.Sc., LLD., F.R.C.P. (C) (Radiology) (ex officio)
Toronto
Chairman, Ontario Council of Health

R.M. MacMillan, M.D., C.C.F.P. (Family Medicine)
Peterborough

P.J. Neelands, M.D., F.R.C.P., (C) (Paediatrics)
Thunder Bay

M. Paikin, B.A., LLD.
Burlington
Member, Ontario Council of Health

S. Skorcz, M.P.H. (Hospital Administration)
Executive Director, Capital Area Health Consortium
Hartford, Connecticut

**Staff:**

Suzanne F. Jackson, M.Sc., Ph.D.
Research Project Manager

B. Khan
Committee Officer

J.A. Gibbons, M.H.Sc.
Research Officer

E.C. Jodoin, M.H.Sc.
Research Officer

J.R. McLaughlin, M.Sc.
Research Officer

**Resource Persons:**

The Task Force is indebted to the following persons for assistance during the course of this study.

Judith D. Bentkover, Ph.D.
Arthur D. Little, Inc.

B.H. Buchanan, M.D. / Lenore Mills
Health Manpower Planning
Policy Analysis and Research Branch
Ministry of Health

W.J. Copeman, M.D., D.P.H., F.C.F.P.
Underserviced Area Program
Ministry of Health

A.S. Detsky, M.D., Ph.D., F.R.C.P. (C)
Department of Health Administration
University of Toronto

A.J. Lee, Ph.D.
Arthur D. Little, Inc.

J.F. Mustard, M.D., Ph.D., F.R.C.P. (C), F.R.S. (C)
President
Canadian Institute for Advanced Research

M.W. Rosenberg, Ph.D.
Department of Geography
Carleton University, Ottawa

D.M. Schatz, Ph.D.
Executive Director
Toronto Institute of Medical Technology

## Appendix 2

# List of Submissions

The Arthritis Society (Ontario Division)

Canadian Diabetes Association

Canadian Geriatrics Research Society

Canadian Paraplegic Association

The Cochrane District Health Council

College of Family Physicians of Canada

College of Nurses of Ontario

College of Optometrists of Ontario

Consumers' Association of Canada (Ontario)

Council of Ontario Faculties of Medicine

Council of Ontario Universities

The Federation of Medical Women of Canada

Hospital Council of Metropolitan Toronto

Ontario Association of Pathologists

The Ontario Cancer Treatment and Research Foundation

Ontario College of Pharmacists

Ontario Council of University Health Sciences

The Ontario Hospital Association

Ontario Mental Health Foundation

Ontario Physiotherapy Association

**Ontario Society of Occupational Therapists**

**Ontario Speech and Hearing Association**

**Professional Association of Interns and Residents of Ontario**

## Appendix 3

# List of Presentations to the Task Force

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College of Family Physicians of Canada (Ontario Chapter)

S. Bain, M.D., President
G. Owen, M.D., Member, Board of Directors
J. Wright, M.D., Past President

Council of Ontario Faculties of Medicine

G.D. Hurteau, M.D., University of Ottawa, Chairman
M.J. Hollenberg, M.A., University of Western Ontario
R.F. Maudsley, M.D., McMaster University

Council of Ontario Universities

E.J. Monahan, Ph.D., Executive Director
J.F. Mustard, M.D., Chairman, Council of Ontario Universities Task Force on Medical Manpower
R. Fraser, Ph.D., Member, Council of Ontario Universities Task Force on Medical Manpower
J.C. Wilson, M.D., Member, Council of Ontario Universities Task Force on Medical Manpower

Ontario Council of Administrators of Teaching Hospitals

P.R. Carruthers, President
J.B. Neilson, M.D., Treasurer
F. Markel, Ph.D., Director of Research

Ontario Hospital Association

G. Cunningham, Executive Director
W.A. Rudy, Associate Executive Director, Member Services
R.A. Slute, Associate Executive Director, Professional Relations and Direct Services

# PART III

## Report of Medical Manpower Task Force, Phase I

# Ontario Council of Health Statement on Report of Medical Manpower in Ontario (Phase I)

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Council was asked by the Minister of Health on June 25, 1981 to advise him on the problem faced by Government, concerning medical manpower requirements and postgraduate education in Ontario. Council appointed a Task Force to address the issue, and report to Council.

The preferable approach would have been to establish appropriate objectives for medical manpower policy within the broader context of the health system and its requirements, and then to deal with the number of postgraduate training positions within that context.

The Minister's most pressing concern, however, was to obtain advice about his stated intention of reducing the number of Ministry-funded postgraduate medical training positions in the Province. Accordingly, the charge to the Task Force was divided into two phased components. Phase I was to develop recommendations concerning policy for postgraduate training including numbers of Ministry of Health funded interns and residents for 1983–4, 1984–5 and 1985–6. This phase was to be completed in time for Council to review the Task Force's study and report to the Minister in time for him to communicate his decision to the universities by June 1, 1982.

Phase II of the study which has now commenced, is to deal with the issue of medical manpower in the broader context, as set forth in the Terms of Reference of the Task Force. (See Appendix I of the Report).

Council has studied the Phase I Report and endorses it. It is satisfied with the methodology used and with the internal consistency and logic of the Report. Council recognizes the limitation of using physician/population ratios as an indicator of manpower needs, but in the absence of better indicators at this stage of the Task Force's deliberation, the Council accepts the reasoning of the Task Force that it found no evidence that the present overall supply of doctors is inappropriate and that it is, therefore, unrealistic to try to return to the ratio which existed in 1974–5 when Government first indicated its policy in respect to the supply of physicians.

Council recognizes the limited scope of Phase I of the Task Force's Report. It is aware that the Task Force identified in a preliminary way the many factors affecting medical manpower supply and demand, and stressed that these quite appropriately are matters for indepth study for Phase II. Council accepts that the proposed overall reduction in the Ministry-funded postgraduate training posts by itself is not likely to achieve the Ministry's objective of controlling physician manpower in Ontario, or correcting any perceived imbalance between specialties in practice, or geographic maldistribution. By the same logic, Council feels that retaining or even increasing the present establishment, by itself, would also have little downstream effect on the numbers and types of physicians practising in Ontario. It also is likely that a reduction of Ministry-funded posts would to some degree be offset by funding of posts from other sources. Indeed, we understand that in Ontario, in one year the number of such non-Ministry-funded positions increased by some 25%, offsetting almost entirely those cuts in Ministry-funded posts already implemented.

Council cannot emphasize too strongly that postgraduate trainees, while pursuing their educational goals, *do perform a significant amount of essential patient care services.* Any reduction in the *overall* number of trainees will reduce the amount of services available to the public or diminish their quality unless they can be replaced immediately with alternative sources for those services. The Task Force did not have the data to measure the impact of such cuts on service or its quality in the teaching hospitals, but the potential for reduction in quality of care clearly exists. This is the reason, we understand, for the Task Force's recommendation that the cuts, if imposed, be implemented over a three-year period rather than a rigid lock step manner, as 5%-5%-5% would require. In this regard, Council is pleased to note that the Minister in his letter of November 27, 1981, recognized that any savings in cost resulting from a reduction of training posts may well be offset by the cost of providing alternative personnel to maintain necessary services.

Council agrees with the conclusions and recommendations of the Task Force as follows:

1. We recommend that the size of the post-graduate medical training establishment be sufficient to:

    a. produce an output which in the absence of movement in or out of the Province would allow Ontario to be self-sufficient in terms of total numbers of active physicians;

    b. maintain the current ratio of one active physician to 659 population (as defined by Low)*. This compares to the College of Physicians and Surgeons of Ontario ratio of 1:549;

    c. meet Ontario's obligation to provide specialist training for other Provinces;

    d. allow for a margin of safety of 10% above the output for a steady state ratio of 1:659 to anticipate probable future needs.

2. We concluded that the Minister's proposed reduction of funded places to a total of 2,077 by 1985 is compatible with our definition of the appropriate size of the training establishment.

3. We find no cause in relation to the desirable size of the postgraduate training program to reject the Minister's proposed total reduction.

4. We find that the proposed reductions will be disruptive to education, research and service and that the Minister therefore should decide to proceed only if he accepts the Task Force recommendation concerning the appropriate size of the postgraduate training establishment.

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*The Low definition is not comparable with the Minister's definition on which the ratio of 1:585 is based (See Appendix "5").

5. We recommend that if the Minister decides to proceed with his plan to reduce the Ministry-funded interns and residents by 425 places by 1985, he should do so only provided that in order to protect the quality of the educational and research programs, the Minister make a commitment to meet the audited costs of teaching hospitals attributable to meeting requirements otherwise met by interns and residents lost as a result of reductions in funded posts.

6. We recommend that if the Minister decides to proceed, the Council of Ontario Faculties of Medicine be invited to submit to the Minister a schedule of reductions of the Council's choosing by which the target of 2,077 can be reached in 1985 and to which the Council is committed.

7. We recommend that the Council of Ontario Faculties of Medicine reassess the recommendation of the Low Committee in regard to the numbers designated for family practice.

8. We recommend that the Minister of Health in consultation with the Council of Ontario Faculties of Medicine review the Ontario obligations for training specialists for other Provinces and the possibilities for reciprocal agreements.

9. We recommend the establishment of a mechanism to provide on-going advice about postgraduate numbers in the light of changing circumstances.

In adopting the above recommendations of the Task Force, the Council wishes to emphasize

*THAT Ministry funding for interns and residents must be maintained until funds are available to train and engage replacement personnel to supply the necessary services now provided by those interns as a result of the reduction in funded positions.*

# ONTARIO COUNCIL OF HEALTH

## Report of the Task Force on Medical Manpower

## Phase I

## Report of the Task Force on Medical Manpower

# Interns and Residents

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**Introduction**

In the Terms of Reference of the Task Force (Appendix 1) we have been asked to offer advice on medical manpower policies for the Province of Ontario. In addition, we were charged with advising on the Minister's intention to reduce the number of government funded places for interns and residents in the postgraduate medical education establishment by 5% on July 1, 1983, a further 5% on July 1, 1984, and a further 5% on July 1, 1985. We regret the circumstances which require advice on the latter question prior to developing proposals for a medical manpower policy framework into which the size of the postgraduate educational program might be fitted. However, given our understanding that the proposed cuts, having been announced by the Minister, will be implemented unless this Task Force shows cause why they should not, or shows why some alternative proposal is more desirable, we have felt obliged to examine the implications of the Minister's planned reductions as our first order of business.

The Terms of Reference relative to the planned reductions invite the Task Force to:

1. Identify and assess significant factors bearing on Ontario's requirements for medical manpower through the 80's;

2. Project probable physician:population supply ratio in 1990, assuming no change in government policies or regulations;

3. Assess the relationship between the current establishment of interns and residents and projected supply of physicians;

4. Develop recommendations concerning policy for postgraduate training including numbers of Ministry of Health funded interns and residents in 1983–4, 1984–5 and 1985–6;

5. Submit a report to the Ontario Council of Health by February 1, 1982.

The Task Force gathered relevant published information from a variety of sources, the most important of which are listed in Appendix 2. In addition, the Task Force consulted with a number of individuals whose knowledge and experience qualified them to assist in our work (Appendix 3). We also consulted representatives of the Ontario Medical Association, Ontario Council of Administrators of Teaching Hospitals, Council of Ontario Universities, Professional Association of Interns and Residents in Ontario, Council of Ontario Faculties of Medicine and Ontario Chapter, College of Family Physicians of Canada (Appendix 4). We have been assisted in analysis of primary data by research staff of the Ontario Council of Health and by Dr. Bruce Buchanan of the Ministry of Health.

### Factors Bearing on Ontario's Medical Manpower Supply

We begin with the following observations about physician supply in Ontario:

1. The number of physicians in relation to population in Ontario has been increasing for 30 years* and is almost certain to continue increasing throughout the decade of the 80's.

2. There is no satisfactory evidence available at this time to justify one particular ratio as the most appropriate to meet Ontario's needs.

3. Compared to other relevant jurisdictions, Ontario appears to be well served in the number of physicians available in relation to its population.

The number of physicians in Ontario (and elsewhere) is defined differently by different sources (Appendix 5). The usefulness of each definition depends partly on the purpose for which it is to be used and partly on the accuracy of the data. For example, a comprehensive listing of all civilian physicians, whether directly involved in medical care or employed in administration, teaching, research or other health-related activities (the Health and Welfare definition) is more useful for commercial mailing than a list of physicians involved in OHIP billing. On the other hand, physicians billing OHIP might be seen to provide a more accurate indicator of supply in relation to health care needs than the College of Physicians and Surgeons of Ontario published register which does not identify the kind of activity of registrants or whether they even live in the province. OHIP billings, however, provide an incomplete picture of physicians involved in care because they exclude salaried physicians and most interns and residents. Additional problems are related to accuracy. For example, according to the brief from the Ontario Medical Association, the names of 140 deceased physicians appeared on the register of the College of Physicians and Surgeons of Ontario.

The Task Force concludes that for the purpose of relating physicians' supply to health care needs, none of the definitions of supply is satisfactory. A reliable and accurate definition would identify the total full time equivalent number of physicians providing health care in a time series covering at least a decade. Such data do not exist and indeed would be exceedingly difficult to assemble, given among others, the problems of defining and calculating full time equivalencies.

Because of these problems we place little significance on any one point describing a ratio of physicians to population except for interjurisdictional comparisons. Changes over time, using constant definitions, however, express trends and are important indicators for policy purposes. We are satisfied that broad definitions, embracing the majority of physicians (such as the College of Physicians and Surgeons of Ontario register of physicians residing in Ontario, or the Health and Welfare, Canada definition of all physicians except those retired, in military forces, or engaged in postgraduate study), and extended over a number of years, proide a reliable way of observing trends. Furthermore, we believe it is reasonable to interpret uch trends as approximate reflections of the supply of physicians in relation to health care eeds. Data from the College of Physicians and Surgeons of Ontario register are shown in able 1 and show an historical and projected trend for an increase in the number of physiians in relation to population. The data from Health and Welfare, Canada show a similar rend for Ontario, moving from a ratio of 1 physician to 695 population in 1973 to 1:626 in 980*.

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*Strategic Research and Manpower Planning Branch

Ar. Justice Hall, in his recent report,† referred to the doctor supply, quoting a national docor:population ratio of 1:666 and predicted that "if present recruitment into the profession ontinues, that ratio may well be one physician to 300 citizens by the year 2000." No data are resented to support the predicted ratio, yet we understand this comment has produced coniderable reaction in several quarters, especially amongst provincial Ministers of Health, and as led to statements suggesting a reduction in numbers of those in Canadian training prorams, both undergraduate and postgraduate.

he number of registered physicians residing in Ontario in relation to population is shown in able 1 and Figure A. It can be seen that using this definition, the physician:population ratio as risen steadily from 1:564 in 1976 to 1:552 in 1980 and is projected to rise to 1:514 by 1990 nd 1:498 by the year 2000.

t should be noted that the output of Ontario's medical schools up to 1985 is already enrolled. Approximately 445 graduates of Ontario medical schools (73%) are expected to register in Ontario. About 165 (27%) are expected to go elsewhere. Of the total new registrants each ear (720), those graduating from Ontario schools will account for about 62% and entries rom other provinces and countries will provide about 38%. The number entering Ontario rom other provinces has been and is expected to be more or less level at about 100 doctors er year. Physicians from other countries (additions to the special register) have been proected at 175 per year until 1986. Thereafter the number will drop to about 85 because gradutes of Category 2 schools will no longer be eligible for licensure‡. This number includes Canadians who have studied medicine abroad, physicians admitted because of special skills equired in Ontario and sponsored relatives of immigrants. The number is much lower than n earlier years and appears to have reached a minimum unlikely to change, unless further hanges are made to immigration policy.

he government of Ontario in 1974 established a policy of maintaining a ratio of 1 physician§ o 585 population**, the ratio in that year (Appendix 5). The selection of this ratio was based n the existing level and the lack of evidence that Ontario was under-supplied. No study of eed was published at that time, although evidence of shortages in northern communities and

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Physicians Stocks and Flows in Canada and by Province in 1973 to 1980, Health Economics and Data Analysis, Health and Welfare, Canada, May 1981.

Canada's National Provincial Health Programs for the 1980's. The Hon. Emmett M. Hall, Special Commissioner.

Annual Report, College of Physicians and Surgeons, Ontario, June 1981.

Physicians on the regular and special registers and residing in Ontario regardless of involvement in clinical medicine.

Letter to Chairman, Ontario Council of Health, from Minister of Health, November 6, 1981.

certain specialties existed. These were considered to represent maldistribution rather than overall shortages.

An attempt in Ontario to address questions of need or demand was undertaken by the Low Committee[*] in 1979 and 1980. The Low Report, however, accepted the existing establishment of active physicians as representing need and to this added numbers related to identified vacancies. Thus no attempt has been made to address the question of need *per se*. Indeed, the problem of defining and measuring need has confounded many studies of medical manpower and continues to be an obstacle to rational planning. It is the absence of a satisfactory measure of need which accounts for our observation that *no* satisfactory evidence is available at this time to justify one particular ratio of physicians as the most appropriate to meet Ontario's needs.

Nevertheless comparative data from different countries suggest that Canada, relatively, is well supplied with doctors. Table 2 lists physician:population ratios from a number of Western countries with developed economies. Similarly, Ontario is generously supplied compared to most provinces in Canada (Table 3).

### Factors Bearing on Ontario's Medical Manpower Requirements

Our hearings and documentation have identified an impressive list of factors which may modify projections of Ontario's need for physicians. We have not been able to begin analyzing the extent or in some cases, the direction of impact of those variables at this time. We list them here to illustrate the complexity of an analysis of changing demand.

1. Population projections: The official projections are subject to error and revision. For example, the most recent projections prepared by the Ministry of Treasury and Economics (1981)[†] anticipate an average annual increase in Ontario's population for the decade of the 80's at about 20,000 less than its previous projection (1978)[‡]. The difference for the decade amounts to 200,000. Applying the Ontario Government's yardstick of 1 physician to 585 population, the variation in the two population estimates represents 342 physicians. Changing policy could cause substantial deviation from the projected population figures. For example, a change in immigration policy could have a significant effect in a period of 10 years.

2. Aging of Ontario's population: The proportion of Ontarians in the age group beyond 65 will increase substantially during the decade. The amount of medical care required by older persons on average is much greater than required by younger people. The Ontario Medical Association, for example, has stated that "this group (older people) require $2^1/_2$ times the medical services needed by the general population"[§]. Careful analysis of the basis for such estimates is needed.

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[*] Postgraduate Manpower Committee, Council of Ontario Faculties of Medicine.

[†] Ministry of Treasury and Economics population projection 1981

[‡] Ministry of Treasury and Economics population projection 1978

[§] Brief from the Ontario Medical Association to the Task Force November 16, 1981, p. 4.

3. The increasing proportion of women in practice: A number of studies have pointed out that women physicians tend to work shorter hours and fewer years than men[*]. On the other hand, some evidence suggests that the practice patterns of women are gradually becoming more comparable with those of men[†]. In any case, the proportion of women entering medicine in Canada has been increasing steadily from 12.8% of first year students in 1967 to 40% in 1980[‡]. The increasing proportion of women may affect the determination of the numbers of physicians needed for Ontario.

4. Changing work habits of physicians: Traditionally physicians have worked long hours. Consistent with general trends to seek shorter work weeks, it has been suggested that physicians in the future may reduce their work loads[§].

5. The introduction of new technologies: Advances such as kidney dialysis and high technology imaging (CAT scanner and ultrasound) while improving treatment or diagnosis, have added new work loads to medical practice. Particular technologies may simplify and reduce the overall time devoted to medical care; others will increase the time required. The net effect of all new technology will probably lead to increasing demands on physicians but quantifying the anticipated impact will be a formidable, if not an impossible task.

6. New specialties: The number of specialties of medicine recognized for certification by the Royal College of Physicians and Surgeons was 21 in 1960, 32 in 1970, 34 in 1980[**]. Emerging areas requiring special competence include emergency-room medicine, neonatology, high risk pregnancy, clinical pharmacology (for poison control centres). Increasing demand related to such developments may be offset by shrinking requirements in other fields, but it is not now clear which specialties will experience decreased demand or what will be the net effect of shifts in need.

7. Utilization of medical services: Prepayment for medical care, whether by way of private or government funded plans, has removed most of the consciousness of costs for both the consumer and the provider. The number of services per capita in Ontario has risen by almost 14% from 1976/77 to 1979/80. While some of the factors already mentioned account for some of the increase, much is related to the "zero cost to the consumer" at the time of the service. Some has been attributed to the "revolving door" practice of the profession, in response to its inability to maintain income in the face of inflation. One cannot separate utilization of services, whether justified or not, from manpower considerations, hence, as the utilization rate rises, it tends to raise the base of definition of need for medical manpower.

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[*] Ibid., p. 3.

[†] Gray, C., "How will the New Wave on Women Graduates Change the Medical Profession." CMA Journal, October 18, 1980, p. 800

[‡] Canadian Medical Education Statistics 1980/81. Association of Canadian Medical Colleges, p. 12.

[§] Brief from the Ontario Medical Association.

[**] Memorandum from the Association of Canadian Medical Colleges

8. The use of allied health personnel: Experimentation with the use of nurse practitioners, physician's assistants, and primary care personnel may lead to practice patterns which will allow physicians to serve more people. On the other hand, the physician's responsibility at the peak of the health care pyramid could add new supervising and managing dimensions to his current activities. How large are the potential gains? How likely are they to be introduced on a large scale?

9. Other incentives are presently being sought with a view to making the system more economical and more effective. New methods of delivering and paying for care such as the establishment of health maintenance organizations are being explored, especially in the United States. They may demonstrate opportunities for further evolution of the Ontario system to improve efficiency and possibly reduce the overall demand for physicians' services.

The above list is not intended to be comprehensive but rather to illustrate that important variables may modify the need for physicians in the years ahead. We intend to assess the probable impact of these variables but we are certain that there are enough imponderables to reject any approach based on the objective of rigorous and precise regulation of the supply of physicians. Based on interjurisdictional comparisons, we see no reason for alarm at the current overall supply of physicians in Ontario. We do, however, have concern about the trend line showing an increasing supply relative to population up to the year 2000. Our final report will examine this issue in depth. Meanwhile we believe that in balance, the net effect of the variables which may affect need for physicians, is unlikely to result in a justification for fewer physicians in relation to population than in 1981.

### Current Output of Interns and Residents

The postdoctoral medical education establishment in Ontario in 1980 provided 2502 places directly funded by the government and 420 places provided by a variety of other sources for a total of 2922[*]. Within the total, 659 government funded positions are for interns; 1843 represent residency posts (Table 4). The residencies were distributed among 36 disciplines including family practice. The number in the various specialties ranged from a high of 259 (general internal medicine) to a low of 1 (infectious dieseases) (Table 5).

The 420 places for non-Ministry funded trainees in 1980 provided opportunities for Canadian citizens, landed immigrants and foreign graduates[†]. The Canadian citizens and landed immigrants accounted for a little more than half the total. The majority of these, according to the Council of Ontario Faculties of Medicine, pursued clinical education at an advanced level often combined with clinical research in preparation for academic careers, which will include a significant amount of clinical practice. The foreign graduates generally have been seeking high quality training unavailable in their own countries. They are expected to return home after their training has been completed. Their presence therefore can be viewed as a contribution by Canada to international training.

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[*] The actual count at any time varies as trainees may leave programs at different times and new trainees may thereafter be recruited to fill vacancies.

[†] For 1981 this figure increased by 30% to 544, for reasons not fully apparent to the Task Force.

The time required following graduation for meeting minimum requirements for all specialty certification by the Royal College of Physicians and Surgeons is 4 or 5 years. The College of Family Physicians requires 2 years after graduation for certification. A certain number of doctors enter practice after one year of internship.

Satisfactory data on actual output of the postgraduate training establishment do not exist. However, the Low Report, building from experience in each specialty and making allowances for attrition from the program, concludes that an enrolment of 1880 residents is required to provide an output of 652 specialists including certified family practitioners per year. The Low Report allows for attrition of 62 positions per year, or 9.5%. This figure agrees well with data from the Council of Ontario Faculties of Medicine which shows that for a sample of 24 specialties the number completing their R.C.P.S. requirements in 1978 was about 90% of the average class size in 1977 (Table 6). It is therefore reasonable to use the ratio of 1880 enrolees for an output of 652 physicians as an index of the relationship between the total residency establishment and annual output of the residency programs. The ratio is 2.88:1.

In order to gauge the impact of the proposed reductions in interns and residents on the supply of physicians in Ontario, it is necessary to estimate not only the output of the postgraduate establishment but also the proportion of interns and residents who will practice in Ontario.

Unfortunately no data on actual destinations of physicians after departure from postgraduate training in Ontario are available. The only data available are stated intentions of trainees provided to the Ontario Physicians Manpower Data Centre annually. A summary of the findings for 1979, 1980 and 1981 is shown in Table 7. It can be seen that the percentage intending to settle in Ontario varied dramatically from year to year—from a high of 45% to a low of 19%. Those choosing Ontario have an inverse relationship to those choosing the rest of Canada, whereas the percentage intending to settle outside of Canada remained close to constant (average 11%). Two conclusions can be drawn. The first is that since intentions vary widely from year to year, it is not possible to predict the number of trainees who will settle in Ontario. For example, applying the percentages registered in Table 7 (and assuming the undecided made choices consistent with the decided) the numbers intending to settle in Ontario from among 1979 trainees would be about 596 physicians; the comparable number for 1981 would be only 233. Similarly, a reduction of 425* in the training establishment could result in a reduction in supply destined for Ontario of 89 (using 1979 intentions) or only 34 (using 1981 intentions). Obviously the plans of trainees are more important than the size of the postgraduate establishment in determining Ontario's supply of new physicians.

The second conclusion which can be drawn is that variables other than the size of the postgraduate establishment are more important in determining additions to the supply of physicians in Ontario. The dramatic differences in stated intentions in a three-year period must reflect changing perceptions of the relative attractiveness of practicing in Ontario or other parts of Canada. While it is not possible to specify exactly what factors prompt particular decisions, it seems highly likely that issues such as the following will be important:

— opportunities to establish viable practices

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*The Minister's proposed total reduction.

— rates of remuneration

— government policies and attitudes toward the profession

— funding of the health system

— extent of regulation

— quality of colleagues

— adequacy of equipment, services and support systems

— overall social and economic prospects.

Finally, it is clearly evident that the anticipated reduction in the supply of physicians in Ontario derived from its postgraduate training establishment is insignificant in relation to the total sources of supply. Additional sources include:

1. graduates of Ontario schools who have obtained postgraduate training outside of Ontario;
2. graduates of other provinces who have obtained postgraduate training outside of Ontario;
3. Canadian graduates of foreign medical schools who have obtained postgraduate training outside of Ontario;
4. foreign medical graduates who have obtained postgraduate training outside of Ontario.

As shown in Table 1, some 275 out of a total of 720 new registrants each year are projected to come from outside the province. Four hundred and forty-five are expected to be graduates of Ontario M.D. programs, but this total represents both those who obtain postgraduate training in Ontario and those who seek training elsewhere. It is self-evident that for those who want to settle in Ontario, a reduction in the number of Ontario training positions will not represent a formidable obstacle. Other loci of training and supply have been of a magnitude which would offset the reductions. The inter-regional migration of physicians after postgraduate training is so great that the number of physicians in Ontario is determined chiefly by factors such as conditions of work and income and is relatively little affected by the number of postgraduate training positions.

We conclude, therefore, that a reduction of 17% in the number of Ministry funded interns and residents would have a relatively small effect on the supply of practicing physicians in Ontario.

**Policy for Postgraduate Training**

We turn now to the question of policy concerning postgraduate training and in particular the number of Ministry of Health funded interns and residents for the years 1983–4, 1984–5, and 1985–6. We address four questions:

1. What were the Minister's objectives in proposing reductions in the Ministry funded postgraduate training positions?
2. Would the reductions achieve the Minister's objectives?
3. What would be the consequences for education, research and service of implementing the proposed cuts?
4. What is the appropriate size of the postgraduate training establishment?

### The Minister's Objective

The Minister's objectives in announcing the cuts were stated in a letter to the Chairman of the Task Force, dated November 27, 1981 (Appendix 6). The Minister's letter sets out background considerations which influenced the decision and then states the specific objectives of the plan. The background concerns included (a) a perception that there is an oversupply of physicians in Ontario and other provinces, (b) recognition that "perhaps half of the specialists trained in Ontario move to other provinces" together with the prospect that Ontario trained specialists will likely not be required in other provinces in the numbers now being trained, (c) a conviction that resolute measures are required to reverse trends toward an oversupply in Ontario.

We addressed the question of perceived oversupply above. To reiterate, we find no evidence that the present level of medical manpower represents an oversupply and we are on the whole reassured by comparing Ontario's current supply with that of other jurisdictions. We understand the Minister's concern about the clear trend for the ratio of physicians to population to increase over the next decade. This matter will be addressed in a later Report.

In view of the trend toward increasing supply in Canada, we understand the Minister's concern that the output from Ontario's postgraduate establishment destined for other provinces may exceed requirements during the current decade. We see this issue in terms of both total new supply and the balance between exports to and imports from other provinces. The issue is discussed below in relation to the question of the appropriate size of the postgraduate training establishment.

We dealt above with the Minister's concern to reverse "the trend towards an oversupply of physicians in Ontario" and the implication that reducing the number of postgraduate trainees would affect the supply of physicians in Ontario. We have shown that reductions in the establishment totalling 425 positions would result in an unpredictable (and perhaps small) decrease in the numbers settling in Ontario. Any decrease can easily be offset by increase in other sources of supply trained outside of Ontario, since 38% of those becoming licensed to practice in Ontario come from other jurisdictions, and by changing intentions of Ontario trained graduates. In other words, reducing the number of interns and residents by 17% cannot of itself be expected to significantly modify the supply of Ontario's physicians.

The specific objectives of the planned reductions are to:

a. adjust specialty training so that in the long run not more than 45% of Ontario physicians are specialists;

b. improve the recruitment of qualified Ontario and Canadian applicants into specialties in short supply (eg. anaesthesia, psychiatry);

c. through improved recruitment, reduce the number of unsuccessful trainees and improve the utilization of existing posts.

**Ratio of General Practitioners to Specialists**

The first specific objective of the Minister is to "adjust" the specialty training so that in the long run not more than 45% of Ontario physicians are specialists. We note first that we have been unable to unearth evidence to justify the target of 55:45. The number appears to have been selected because it represented the existing ratio in 1975 and a wish on the part of the government to maintain the status quo. In our hearing with the Council of Ontario Faculties of Medicine we were told that there are no studies in the world which identify the best ratio of general practitioners to specialists. It may be that the Low Report offers the closest approximation to a satisfactory analysis. The Low Committee's study groups confirmed that each physician listed is active and fulfilling a need related to his or her field. The ratio of general practitioners to specialists for all active physicians in 1981 was 48:52. The Low method offers the advantage of being a very detailed cumulative approach and the disadvantage that the judgements about need simply assume that all active physicians are appropriately employed. Until better data are available, we find the Low Report, as a reflection of the status quo, no better and no worse than the government's judgment that the optimum ratio is 55:45.

We are concerned, however, that the Low Report implies moving downward from the current ratio of 48:52 for active physicians to a ratio of 46:54 ten years hence. This is because family medicine is allocated an additional output of 50 over the decade in recognition of "immediate need"; specialties are allocated an output of 643. We believe that some reassessment of the Low Committee's advice is in order.

We must draw attention to a technical problem which has led to confusion concerning general practitioner : specialist ratios. The Low Report bases its figures on "active" physicians, i.e. physicians for whom their discipline represents more than 50% of their time. The Minister's ratio is based on the total number of doctors licensed to practice in Ontario and residing within the province, regardless of activity. Thus the 48:52 ratio in the Low Report cannot be compared with the 55:45 ratio desired by the Minister, and in particular it is erroneous to infer from the Low Report that in the Minister's terms the ratio of general practitioners to specialists is too low. On the contrary, using the same definition used by the Minister it is apparent from Table 8 that the ratio of general practitioners to specialists has remained constant and consistent with the Minister's target. We conclude therefore, that no adjustment in specialty training to achieve the desired target is necessary. We do so, however, without making a judgement on the merit of the target in the first instance.

Further, even if an adjustment were needed, we fail to see how a reduction in numbers of interns and residents would facilitate it in isolation of other market factors. The competition for available places would increase and since family medicine would represent only one voice among a host of powerful voices in the 36 disciplines, we would anticipate that family medicine would face a harder task to hold its own.

For the same reasons given above, we believe that fine tuning the ratio of training positions by itself will have a marginal impact on the eventual ratio of those practicing in Ontario.

### Recruitment of Ontario and Canadian Graduates

The next objective of the Minister is to improve the recruitment of qualified Ontario and Canadian applicants into specialties in short supply. We note that the Low Report has targeted the two examples used by the Minister (anaesthesia and psychiatry) for the largest establishment to meet Ontario's needs, namely 142 and 229 places respectively. Given the support for the Low proposals from the Council of Ontario Faculties of Medicine, it appears that candidates for the two disciplines in question would be actively recruited whether or not cuts in places occurred. However, the Deans noted that removing training opportunities in the more attractive specialties in the past has not directed trainees into the less popular fields. In addition, the Deans in their brief observed that "Although some specialties are acknowledged to be in greater manpower deficit than others, it is perceived that the proposed reduction will offset (negatively) the medical school's ability to recruit to understaffed specialties"*. We concur, since we cannot see how the distribution of fewer posts can be expected to favour those in shortest supply.

The Council of Ontario Faculties of Medicine, by agreement with the Minister, is responsible for allocating the available places. In its brief the Council clearly recognized a host of considerations and options for making the cuts if they are to proceed. However, the statement was made at our hearing that if the Deans have to make the decision "there is only one way to do it—pro-ration". In fact, the 2% cut to be implemented in 1982 is in most instances being made "across the board in departments and hospitals". The Deans were particularly concerned at being forced to make cuts for which they and the medical educators see no rationale. On the other hand, they expressed some optimism that they could make the cuts according to a plan if they and their colleagues perceived a reasonable rationale and adequate guidelines. The Task Force, however, believes that if fewer places are available and all fields are competing for their perceived legitimate share, reductions as such will be of no aid to recruitment to areas of recognized shortage.

### Reduction of Academic Attrition

The final objective of the Minister is to reduce the number of unsuccessful trainees through improved recruiting. The Deans in their brief observe that "attrition from postgraduate training programs is usually the result of change in career plans. Trainees either leave specialty training programs to enter general practice, or transfer from one specialty training program to another—either in Ontario, other provinces or abroad. A few trainees are asked to leave programs because of academic deficiencies. Thus is it possible that by selecting the best qualified applicants, there will be fewer trainees lost to programs through attrition. A perverse situation may develop whereby larger numbers of trainees will be accepted primarily because of their ability to provide their own funding rather than their academic ability".

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*Brief from Council of Faculties of Medicine, p. 9.

The view expressed in the brief was reinforced in the hearing by the statement that the Deans would make quality the primary criterion in allocating Ministry funded places. This policy should reduce the apparently already small attrition due to academic considerations.

### Summary

1. We find no evidence at this time to justify one particular ratio of physicians to population as the most appropriate to meet Ontario's needs.

2. We find no evidence for a current oversupply of physicians in Ontario.

3. We share the Minister's concern about the trend to increasing supply.

4. We understand the Minister's concern that the output of Ontario's programs destined for other provinces may exceed requirements in the 1980's.

5. We do not anticipate that a reduction of 17% in the number of interns and residents will significantly affect the supply of physicians settling in Ontario.

6. We find no need to adjust the ratio of general practitioners to specialists either to achieve the Minister's objective of a ratio of 55:45 (because the ratio is holding at that position) or to achieve an ideal ratio established by empirical analysis.

7. We are concerned that although the Low Report supports the current ratio of active general practitioners to specialists it calls for a relative increase in the number of specialists in the 1980's. We believe this inconsistency requires review by the Council of Ontario Faculties of Medicine.

8. We do not believe that a reduction in number of interns and residents will favour recruitment to specialties in short supply.

9. We expect that since the Deans plan to recruit the best qualified candidates the cuts, if implemented, would result in a decrease in the small attrition attributable to academic considerations.

### Consequences of Reducing Numbers of Interns and Residents

What would be the consequences for education, research and service in teaching hospitals of implementing the proposed cuts? These are matters of concern to the medical schools, teaching hospitals and the Professional Association of Internes and Residents in Ontario. The Council of Ontario Faculties of Medicine summarized the impact in tabular form in its brief (Table 9).

The Council of Ontario Faculties of Medicine noted first that pro rata reductions will in the case of small programs threaten viability. COFM sees the possibility of addressing this problem by inter-university cooperation in establishing conjoint programs. Alternatively, programs below the necessary "critical mass" could be phased out, leaving larger programs to meet the need. This option, at least temporarily, would create morale problems, a tendency for specialists to drift away from services which are no longer teaching departments and consequently some difficulty in maintaining service commitments. We note, however, that some schools have never had programs in all specialties and are coping.

Another problem would be a reduction in opportunities for under-graduates to learn from residents because fewer would be available and because those available might be under pressure to meet service requirements. This in turn could reduce the educational time available to the residents for their own needs.

Likewise, the need to meet the demands of clinical activity could reduce opportunities for funded research years for residents and could reduce time available for research by faculty. This problem is seen by the Council of Ontario Faculties of Medicine as compounding a trend for fewer graduates to seek research opportunities and chose research careers.

The pressures to meet service demands are seen as central to all of the considerations. Since hospitals must meet the service needs, it is feared that for both faculty and residents greater service demands will divert effort and energy from both education and research with the danger that both will suffer.

It should be noted that the comments of the Deans signal the prospect of larger numbers of non-Ministry funded positions to offset losses of Ministry funded positions. Such possibilities appear real; the prospect of accepting applicants from Saudi Arabia was identified as an example. The Task Force has no doubt that some increases in non-Ministry funded posts will soften the immediate consequences of annual cuts for three years if the cuts are implemented.

In addition to the comments of the Deans, the Task Force was made aware that community based and outreach educational programs may find their pool of residents reduced. This may occur as residency programs become redesigned with more local service needs in mind. A reduction in the flow of these residents may intensify problems of maldistribution and service in remote areas of Ontario.

The Task Force has no doubt that the concerns are genuine. A cut of 17% over four years would be disruptive. Some programs , marginal in size or quality, might have to be terminated. Shifts in allocation of places might be required to recognize manpower needs or the emergence of new requirements such as emergency room medicine. Consideration might have to be given to the option of terminating the teaching status of entire hospitals or hospital departments. Obviously such choices would be distasteful and disturbing to morale.

Difficult and disruptive as it may be, the Task Force does not, however, see it to be beyond the capability of the medical schools and teaching hospitals to make the adjustments if they are justifiable, without danger to the overall quality of education, research and service. To be able to make the adjustments, the schools and hospitals would require firm commitment from the Minister of Health in meeting the costs. Service costs would be inevitable, since the hospitals would have to replace the service functions previously performed by interns and residents no longer available. The ways of doing this would need to be designed to protect the integrity and quality of educational and research activity.

Neither the existing complement of faculty nor interns and residents should be responsible for assuming the additional service loads. These would need to be met by recruitment of additional physicians and/or additional and perhaps specially trained nurses, nurse practitioners or other allied health personnel. Ingenuity would be required and it would need to be backed by financial resources. The Task Force does not know what the costs of replacing service performed by interns and residents would be but can well imagine that in at least some departments, it would be greater than the savings accruing from reducing the numbers of interns and residents. On the other hand, experienced physicians and surgeons in many cases might effect savings due to more efficient provision of services in the absence of teaching.

In addition, a reduction in the number of interns and residents will have some effect on the basic income unit (BIU) income of institutions having medical schools. This will be relatively small, however, provided that the Government continues to fund its universities on a global basis without reference to changes in the provincial BIU total.

The Task Force believes that although cuts would be painful and disruptive, they could be made without appreciably affecting the quality of the postgraduate training program, provided the resources for service needs are met by the Minister and adequate transition time is allowed. We believe the medical schools and hospitals are capable of responding skillfully and that, provided a decision to cut was accompanied by an understandable rationale, they would meet the challenge.

### Size of the Postgraduate Training Establishment

We turn finally to the question of the appropriate size of the postgraduate training establishment. At the outset, we state unequivocally that the size of the postgraduate training establishment should be related to Ontario's medical manpower needs and responsibilities. The production of medical manpower is the raison d'etre for the existence of postgraduate training programs. It is an expensive enterprise, drawing heavily on the public purse. This is not to say that the production of medical manpower is the only function of the training programs. They provide environments for clinical investigation, for research, for the most sophisticated tertiary care and for the training of allied health personnel. They provide essential work settings for the faculty of medical schools and they provide appropriate locations for the placement of the most expensive and sophisticated technologies which for fiscal reasons must be allocated prudently. They provide the clinical environment essential to the accreditation of medical schools.

All these functions are important. They impact on the participants in postgraduate programs differently, depending on what purposes are being served by them, be they faculty, trainees, support staff or patients. The result is that any proposal which threatens the security of any part of the system is perceived by some as threatening to career objectives and professional values which they hold dear.

Nevertheless, in the last analysis it must be recognized that the system exists to serve the needs of medical manpower and that all the other functions are derivative. It is for this reason that the Task Force concludes that the proper size of the postgraduate training system is the size which is required for Ontario's medical manpower needs and responsibilities.

The Low Report begins with an implication that the output should be sufficient to maintain the current ratio of active physicians to population, irrespective of the actual destination of the products of the system and irrespective of the flow into Ontario from other sources. In other words, the size should be large enough that Ontario could be self-sufficient if the entire throughput of the residency program settled in Ontario and the Province did not import or export any specialists. We accept this proposition as a starting point.

Our reason for doing so is that this policy is the safest for Ontario. Ontario cannot be confident that physicians from other parts of Canada and physicians from other countries with standards equal to ours will always be available. To gear our own postgraduate training to the assumption that we will have access to physicians from elsewhere would leave Ontario vulnerable to a variety of decisions beyond our borders which could endanger our supply of qualified specialists. Moreover, a policy such as we suggest, implemented in all regions of Canada, would go a long way towards ensuring that the Canadian supply of physicians is matched to Canadian needs.

As stated above, the Task Force found no evidence to justify selection of a particular ratio of physicians to population. However Ontario's supply of doctors relative to population is not out of line with that of other provinces and other comparable countries. In the absence of evidence that the Ontario total current supply is either too large or too small, we accept the Low conclusion that the current supply in relation to population should be maintained. In adopting this position we recognize that the present supply is richer than the target of 1 physician to 585 population set by the government in 1974. The apparent merit of the 1:585 ratio was that it represented the actual 1974 ratio and served the government's efforts toward the containment of costs. We acknowledge that the present ratio (1:544, see Table 1) has no more evidence to justify it than had the 1974 ratio. However, we see no acceptable method of reversing the trend and returning to the government's arbitrary target, and we see great dangers in any such effort. A perusal of the factors which may influence need in the years ahead led us to the conclusion that it is unlikely to result in a justification for fewer physicians in relation to the current ratio.

The Low Report adds two components to the current establishment: (a) a component representing identified vacancies, and (b) a component representing implicit obligations to train specialists for other provinces. The Task Force is not able to accept the vacancies as a satisfactory component in a calculation of need. In the first place, identified vacancies have not been determined on an objective basis, taking into consideration reasonable access to required services, estimates of morbidity, or appropriate specialist work loads. They appear to represent the desires expressed by physicians, to have a comprehensive array of specialists available locally. Problems of distribution and the possibility, indeed likelihood, that oversupply in some communities might offer opportunities for trade-offs, appear not to have been considered. Also, the existence of budgeted vacancies does not necessarily represent high priority in the current setting of financial constraint which demands the making of choices.

Nevertheless, as stated above, the Task Force believes that the net effect of a number of factors bearing on need will be a requirement for some increases in the supply of physicians. Notable among factors which will lead to additional needs are aging of the population, an increasing proportion of women in medicine, changing work habits, new technologies, and new specialties. We are unable at this time to assess the dimension of additional needs but we are convinced that a margin of safety must be included in the calculation. For the moment we believe that a reasonable allowance for this factor would be 10% of the number necessary to maintain a steady ratio of physicians to population.

The last component in the Low Report is a factor for Ontario's implicit obligation to train specialists for other provinces. In this case we are dealing with national need and the development of informal arrangements by which Ontario as a large and historically economically favoured province has accepted responsibility to assist other parts of Canada. We wholeheartedly support the principle. It would make no more sense for each province in Canada to produce a complete constellation of specialists than for each medical school in Ontario to aspire to the same objective. Some specialties require few practitioners and a very small number of training programs could meet the entire national need.

Accepting the principle that Ontario should be prepared to provide some specialist training for other provinces, we believe such arrangements need not represent a "one-way street". Other provinces have well-developed postgraduate training and it seems likely that in some cases they might accept some reciprocal responsibility to assist in meeting Ontario's needs. The Task Force does not know the extent to which such opportunities exist or even the degree to which such arrangements are already in place.

We note in addition that provincial governments as paymasters for training programs have some interest in provincial reciprocity. We recommend therefore, that the Minister of Health, in consultation with the Council of Ontario Faculties of Medicine, review the Ontario obligations for training specialists for other provinces. Meanwhile the Task Force accepts the Low estimate of 119 places for the annual commitment to the training of specialists for other provinces as an appropriate interim estimate.

In summary, the Task Force recommends that the size of the postgraduate medical training establishment should be sufficient to:

1. produce an output which in the absence of movement in or out of the province would allow Ontario to be self-sufficient in terms of total numbers of doctors;

2. maintain the current ratio of active physicians to population;

3. meet Ontario's current obligation to provide specialist training for other provinces;

4. allow a margin of safety to meet additional future needs arising because of an aging population, an increase in the proportion of women physicians, changing work habits, new technology, new specialties and possibly other factors.

The Low Report developed an estimate of the required size of the postgraduate establishment to maintain the current ratio of physicians to population. This estimate included components for attrition of physicians (i.e. losses due to death, retirement and emigration) and for adjusting for population growth. As the Low Committee recommended, "output targets and resident establishment should be reviewed regularly to provide for changing verified needs".

The Task Force undertook such a review in relation to both attrition and population growth. The Low Report uses a working assumption of 3.5% for attrition. This represented the usual figure judged by the individual specialty groups to be appropriate for their particular specialty. The Task Force derived an alternative and, it believes, more reliable figure.

Attrition as defined by Low and as displayed in Table 1 includes three components—death, retirement and net emigration. The latter (net emigration) represents physicians registered and resident in Ontario who leave the province, *minus* those physicians registered in Ontario but resident elsewhere who return to the province. The figure is misleading because it fails to take into account the approximately 275 doctors trained elsewhere who enter Ontario each year (Table 1). A true figure for net migration would account for all those leaving *and* all those entering the province. Based on the migration experience over the past four years, Ontario has had an average *net immigration* of 106 annually*.

We have chosen however, to exclude immigration and emigration from a calculation of attrition in order to remain consistent with our definition of the appropriate size of the postgraduate training establishment—large enough that Ontario could be self-sufficient if the entire output of the residency program settled in Ontario and the province imported and exported no specialists (either Royal College or College of Family Physicians).

Our model assumes that the current number of physicians in relation to population should be accepted in the absence of objective evidence that it should be changed. Maintaining the current ratio requires allowances for population growth and for death and retirement—but not for emigration or immigration. Self-sufficiency assumes no movement in or out of the province.

Thus the proper figure for attrition is the figure attributed to deaths and retirement. This can be approached in two ways. One way would be to deduct from the total attrition (Table 1) the numbers attributable to net emigration (as defined above). An estimate of the latter is available from the College of Physicians and Surgeons of Ontario for four years, based on change of address. Table 10 shows for the four years in question total attrition, emigration and residual attrition due to death and retirement. The average for four years is 1.9%.

The second and more reliable approach is to calculate anticipated deaths using Canada Life Tables and retirement assuming an age of 65 for that event.

The result is shown in Table 11. It can be seen that the average rate is projected at 2.5%, representing a reliable though perhaps generous estimate of attrition due to death and retirement. The assumption of retirement at age 65 is probably an overestimate. For example, in 1978, 962 physicians beyond age 65 were involved in some billing of OHIP.

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*This figure is derived by subtracting the average annual net emigration as defined above and displayed in Table 10 from the average annual movement into the province, as displayed in Table 1, Columns 7 and 10.

The Low Committee used an average annual population growth of 89,000 derived from the 1978 Treasury and Economics forecast. This forecast was updated in 1981 and provides a significantly smaller projection, averaging 70,336.

The revised estimates of attrition and population growth result in an estimate of 417 physicians per year needed to maintain the current active physician ratio of 1:659*. The calculation is derived as follows:

$$\begin{aligned} \text{Attrition} &= 12{,}996 \times 2.5\% = 325 \\ \text{Population allowance} &= 70{,}336 \div 665 = \underline{105} \\ \text{Total} &= 430 \end{aligned}$$

This figure is lower than the Low Report estimate of the output required for Ontario (652) by some 222 physicians, partly because of the Low component for "immediate need", i.e. vacancies, totalling 63.

The margin of safety allowance for new needs is 10% of the number required to maintain a steady state, i.e. 10% of 430 or 43.

The total required output for Ontario therefore is 473. The establishment required to yield an output of 473 physicians can be calculated by turning once again to the Low Report. Allowing for the minimum requirements for certification, the attrition from the program and supplementary training beyond minimum requirements, the Low Report shows that a total establishment of 1,880 is required for an annual output of 652. Applying this ratio to the required output of 473, the required establishment would be $\frac{459}{652} \times 1{,}880 = 1{,}364$. To this figure of 1,364 must be added the annual positions for obligations to other provinces (119) and places for interns (659) for a total of 2,142 places.

This figure, however, fails to account for the fact that a small and unfortunately unknown proportion of interns enter practice directly after their one year rotating or mixed internship. The calculation therefore represents the largest the establishment might need to be, consistent with the assumptions in the model. There is reason to believe that the numbers of interns entering practice after only one year may be shrinking as hospitals across Canada are requiring more experience prior to granting practice privileges. Undoubtedly the required establishment is less than the theoretical figure of 2142 but in the absence of reliable data on the number entering practice in Ontario after a one year internship, a more precise figure cannot be calculated. In any case, our purpose is not to be precise but to determine whether the Minister's proposed cuts would be compatible with our estimate of need†.

The revised global estimate of the required training establishment can now be compared with the current actual establishment as it would be modified by application of the Minister's proposed cuts in funded places.

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*The ratio of course is based on the Low definition of physician supply and must not be confused with the government's ratio 1:585 based on the government's definition of physician supply.

†As an example only, if 60 interns entered practice after one year, this number should be deducted from the output requirement for residents of 473, leaving a total of 413. The establishment to achieve this output would be 1191. The total places required would be 1969.

The total number of funded Ministry positions in 1981 (November) was 2,502. The proposed reductions would result in the following figures:

1982 reduction of 50 = 2,452
1983 reduction of 125 = 2,327
1984 reduction of 125 = 2,202
1985 reduction of 125 = 2,077

To the figure of 2077 must be added a *proportion* of the non-Ministry funded places (544 total in 1981). This is because about one half of this group are Canadians and landed immigrants and although some will enter academic medicine, some, possibly the majority, will be active clinicians. Again the proportion of the 544 entering clinical practice cannot be determined accurately but it is clear that, added to the total of 2,077 places which the Minister proposes to fund, the total available would be comfortably close to the maximum number required to fit our model.

The inescapable conclusion is that the Minister's proposed reductions pose no threat in relation to the logic of the Low Report and the Task Force's definition of the appropriate size of the postgraduate training establishment. We conclude, therefore, that in relation to our proposed definitions of the appropriate size of the postgraduate training establishment, we find no cause to reject the Minister's planned reductions in funded internships and residencies.

We believe, however, that if the Minister decides to proceed, he should limit his concern to his ultimate target of a total reduction of 425 places by 1985. It is entirely possible that more efficient or less disruptive staging of the cuts over the three years than the uniform reductions of 125 places each year could be devised. We propose that the Council of Ontario Faculties of Medicine be invited to submit a schedule to the Minister which commits it to completing the 425 cuts in funded places by 1985.

We note finally that whereas our estimate of Ontario's need (according to our definition) is 473 additions to active practice each year, the actual number being added to the register is about 720, reducing to 630 in 1986. Ontario's postgraduate training establishment apparently provides only a minority probably not more than one-third*. The problem of increasing supply obviously is not attributable to the size of the postgraduate program as much as it is to the number of graduates who decide to stay and the entry of physicians from out of the province and out of the country. Many of these will be Ontario residents and graduates of Ontario medical schools returning to the province.

## Conclusions and Recommendations

1. We recommend that the size of the postgraduate medical training establishment be sufficient to

    a. produce an output which in the absence of movement in or out of the province would allow Ontario to be self-sufficient in terms of total numbers of active physicians;

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*If half of the output settled in Ontario, the number would be less than one-third of new registrants.

b. maintain the current ratio of 1 active physician to 665 population (as defined by Low)*. This compares to the College of Physicians and Surgeons of Ontario ratio of 1:551;

c. meet Ontario's obligation to provide specialist training for other provinces;

d. allow a margin of safety of 10% above the output for a steady state ratio of 1:665 to anticipate probable future needs.

2. We conclude that the Minister's proposed reduction of funded places to a total of 2,077 by 1985 is compatible with our definition of the appropriate size of the training establishment.

3. We find no cause in relation to the desirable size of the postgraduate training program to reject the Minister's proposed total reduction.

4. We find that the proposed reductions will be disruptive to education, research and service and that the Minister therefore should decide to proceed only if he accepts the Task Force recommendation concerning the appropriate size of the postgraduate training establishment.

5. We recommend that if the Minister decides to proceed with his plan to reduce the Ministry funded interns and residents by 425 places by 1985, he should do so only provided that in order to protect the quality of the educational and research programs, the Minister make a commitment to meet the audited costs of teaching hospitals attributable to meeting service requirements otherwise met by interns and residents lost as a result of reductions in funded posts.

6. We recommend that if the Minister decides to proceed, the Council of Ontario Faculties of Medicine be invited to submit to the Minister a schedule of reductions of the Council's choosing by which the target of 2,077 can be reached in 1985 and to which the Council is committed.

7. We recommend that the Council of Ontario Faculties of Medicine reassess the recommendation of the Low Committee in regard to the numbers designated for family practice.

8. We recommend that the Minister of Health in consultation with the Council of Ontario Faculties of Medicine review the Ontario obligations for training specialists for other provinces and the possibilities for reciprocal agreements.

9. We recommend the establishment of a mechanism to provide on-going advice about postgraduate numbers in the light of changing circumstances.

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*The Low definition is not comparable with the Minister's definition on which the ratio of 1:585 is based (See Appendix 5).

## Appendix 1

# Terms of Reference

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The Ontario Council of Health has been asked to advise on medical manpower requirements for Ontario, including related educational considerations.

In arriving at sound conclusions on these issues, Council must have an understanding of the relevant basic factors on which to identify options and to make judgements in respect to both near term and long term policy. In general, these relate to both the *content* of the information and to the *context* within which it is used.

More specifically the *context* factors would include:

1. Some consideration of the political and policy environment in which the study results would operate. For example, what are the likely external social values and economic conditions Ontario is likely to be facing, say in 1990 — eight years from now, as well as the internal values and arrangements expected in the health and medical care system.
2. The relationship of the medical manpower pool to such things as adequacy of medical services on the one hand, and cost on the other.
3. The role of incentives for cost-effectiveness and cost-benefit. The linkage between program and service decisions and responsibility for generating support funding.
4. The impact on medical services and costs of different modes of service delivery.
5. The effects of "physician extenders".
6. The effects of new technology.

The *content* aspects of the study include factors, ranges, trends, impact, and reliability of data regarding such things as:

1. Population projections — numbers, age groups, ethnic make-up.
2. Physicians — age and sex distribution, attrition rates.
3. Physicians — population ratios — the bases for them, comparison with other jurisdictions, relationship between ratios and various health and disease indices.
4. Women in practice.

5. Physician productivity.

6. Immigration/emigration/interprovincial immigration.

7. Canadians studying outside Canada.

8. Education and licensing — health and content of programs, length of prelicensure training, sources and amounts of funding support.

9. Role of postgraduate trainees in hospital service, in teaching of undergraduates in medicine, and other health disciplines.

Because of the very broad scope of the manpower issue, and its inumate relationship with the larger issues of health and sickness, and the growing costs of health related programs, the Task Force is asked to accept two interrelated assignments, one short-term and one long-term. The answers required in the short term are those most closely related to the content of the issue, but should be sought keeping in mind the longer-term context-related considerations.

The terms of reference for the short-term study are to:

1. Identify and assess the significant factors bearing on Ontario's requirements for medical manpower through the 80's.

2. Project probable physician/population supply ratios to 1990 assuming no change in government policies or regulations.

3. Assess the relationship between current establishment of interns and residents and projected supply of physicians.

4. Develop recommendations concerning policy for postgraduate training including numbers of Ministry of Health-funded interns and residents for 1983–4, 1984–5 and 1985–6.

5. Sumbit a report to the Ontario Council of Health by February 1, 1982.

The terms of reference for the long-term study are to:

1. Recommend appropriate objectives for medical manpower policy taking into consideration the Government's purpose in controlling the form and rate of economic growth in the 1980's and its objective of cost-effective evolution of the health system.

2. Identify policy options for achieving and maintaining the recommended objectives.

3. Recommend appropriate policy options and appropriate methods of implementation.

4. Report to the Ontario Council of Health by February 1, 1983.

## Appendix 2

# List of References

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*A.C.M.C. Forum*. Canadians Studying Medicine Abroad. (xerox), August/September 1979.

*A.C.M.C. Forum*. Manpower Again. (xerox), June 1981.

Baltzan, M.A. "Medical Care Costs and Physician Manpower — A New Economic Theory" In: *Ontario Council of Health. Physician Manpower.* Toronto. Ontario Council of Health, 1974.

Bloom, B. et al.. "Physician Manpower Expansionism: A Policy Review." *Annals of Internal Medicine,* February 1979.

Bloom, B. and O. Peterson. "Changing the Number of Surgeons," *The New England Journal of Medicine,* November 20, 1980.

"Why More Doctors Won't Mean Lower Bills." *Business Week,* May 11, 1981.

Chouinard, J. Number of First Year PG-L Preregistration training Positions in Ontario, July 1978. Personal communication to Dr. D.M. Buchanan, Ontario Ministry of Health, June 1979.

Clarkson, G.C.. Doctors Already Licensed with C.P.S.O. Emigration, Immigration and Net Movement from Ontario to the U.S., Other Provinces and Other Countries 1977 to 1980. (xerox), June 1981.

Council of Ontario Faculties of Medicine Postgraduate Manpower Committee. *"Graduate Medical Education — Guidelines to the Resident Establishment".* (The Low Report)

Council of Ontario Faculties of Medicine Postgraduate Manpower Committee. *"A 'Forward Planning' Formula for Graduate Medical Education".*

Dresnick, S. et al. "The Physician's Role in the Cost-Containment Problem," *J A M A,* April 13, 1979.

Faltermeyer, E. "Where Doctors Scramble for Patient's Dollars." *Fortune,* November 6, 1978.

Fuchs, V. "The Coming Challenge to American Physicians" *New England Journal of Medicine,* June 11, 1981.

Geyman, J. "Future Medical Practice in the United States." *J A M A*, March 20, 1981.

Gray, C. "How Will the New Wave of Women Graduates Change the Medical Profession," *CMA Journal*, October 18, 1980.

Hall, T. "Estimating Requirements and Supply: Where Do We Stand?" In: *W H O. Pan American Conference on Health Manpower Planning*, September 10–14, 1973. W H O, September 1973.

Kirchner, M. "Doctor Surplus: What 1990 Will Look Like," *Medical Economics*, September 29, 1980.

Korcok, M. et al.. "Report Issued by Requirements Subcommittee of the National Committee on Physician Manpower." *Canadian Medical Association Journal*, August 1976.

McNerney. "Control of Health Care Costs in the 1980's" *New England Journal of Medicine*, November 6, 1980.

Minnie, W. Projections of Physician Supply in Canada. Health and Welfare Canada, (xerox), April 1980.

Moloney, T. and D. Rogers, "Medical Technology — A Different View of the Contentious Debate Over Costs," *The New England Journal of Medicine*, December 27, 1979.

*Ontario Council of Health. Physician Manpower.* Toronto: Ontario Council of Health, 1974.

Ontario Ministry of Health, Health Manpower Planning. Estimated Physicians Resident in Ontario. (xerox), April 1979.

———. Historical Presentation in Ontario Manpower Supply — 1964–1979. (xerox), November 1980.

———. M D/Population Ratios Canadian Provinces. (xerox), September 30, 1980.

———. Medical Manpower — Selected Tables/Data. (xerox), See also: References indicated on each sheet.

———. Preliminary Estimate of the December 1980 Physician Population Ratio. (xerox), June 1981.

———. Projection of Ontario Medical Manpower Supply (Residing in Ontario) to 2000. (xerox), June 1981.

Reinhardt, U. *Physician Productivity and the Demand for Health Manpower.* Cambridge: Ballinger Publishing Company. (Chapter 8, Summary and Conclusion), 1975.

Royal College of Physicians and Surgeons of Canada. An Analysis of Some Basic Characteristics of the Population of Specialists Certified by the Royal College of Physicians and Surgeons of Canada in the Decade 1970–1979. (xerox) March 1980.

Stephenson, Dr. B. Ontario Citizens Studying Medicine Abroad. Ministry of Colleges and Universities (xerox), June 1979.

———. Sources and Divergencies of Physician Supply. Data 1977 to 1979. (xerox).

———. Summary of Provincial Educational Programs Output. (xerox), June 1980.

## Appendix 3

# List of Individuals Consulted By the Task Force

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James E. Bennett, J.D.,
Managing Director, McKinsey & Company, Management Consultants
(Toronto Office)

Bernard S. Bloom, Ph.D.,
Professor, University of Pennsylvania, Department of
Research Medicine.

Maureen Law, M.D.
Assistant Deputy Minister, Health Services and Promotion,
Health and Welfare, Canada.

James A. Low, M.D.,
Chairman, Postgraduate Manpower Committee, Council of
Ontario Faculties of Medicine

Douglas Waugh, M.D.,
Executive Director, Association of Canadian Medical Colleges.

## Appendix 4

# List of Organizations whose Officers were Consulted by the Task Force

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College of Family Physicians of Canada (Ontario Chapter)
- John Wright, M.D., President
- Grahame Owen, M.D., Past President

Council of Ontario Universities
- J.F. Mustard, M.D., Chairman, Advisory Committee on Occupational Health and Safety
- E.J. Monahan, Ph.D., Executive Director

Council of Ontario Faculties of Medicine
- G.D. Hurteau, M.D., University of Ottawa
- J.C. Laidlaw, M.D., McMaster University
- F.H. Lowy, M.D., University of Toronto
- S.L. Vandewater, M.D., Queen's University

Ontario Council of Administrators of Teaching Hospitals
- J.B. McAulay, M.D., President
- F. Markel, Ph.D., Director, Research and Information Office
- J.D. Snedden, Past President

Ontario Medical Association
- Lionel Reese, M.D., President
- Murray McAdam, M.D., Vice-President
- Paul Clarke, M.D., Director of Medical Services

Professional Association of Internes and Residents
- P. Dorian, M.D., President
- P. O'Bryne, M.D., Past President
- B. Kane, M.D., Treasurer
- L. Ross, M.D., Executive Director
- D. Stephens, M.D.

## Appendix 5

# Sources of Information for and Definitions of Medical Manpower Supply

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The number of physicians in Ontario can be described in at least seven major different ways

1. *C.P.S.O. Register as published* in Annual Report of the College of Physicians and Surgeons (General and Special Registers).

2. *C.P.S.O. Register:* The total number of doctors licensed to practise in Ontario and *residing within the province,* regardless of age or degree of activity. The C.P.S.O. registry means in practice, those doctors licensed on the General and Special Registers of the College. It excludes interns and residents on the Educational Register.

3. *C.P.S.O. Register* (under 65): The total number of doctors licensed to practice in Ontario and residing within the province — under the age of 65. (It is considered by some that this provides a more accurate indication of probably active physicians.)

4. *OHIP* (Total Doctors billing): The total number of doctors billing OHIP, both directly or indirectly, (through their patients). This method excludes doctors who are giving patient care exclusviely on salary, some in administration and research, etc.

5. *OHIP* (Doctors billing over $10,000): Doctors billing OHIP who bill over $10,000 per year. The elimination of doctors who bill under $10,000 is an approximate method of restricting the count to the more active physicians.

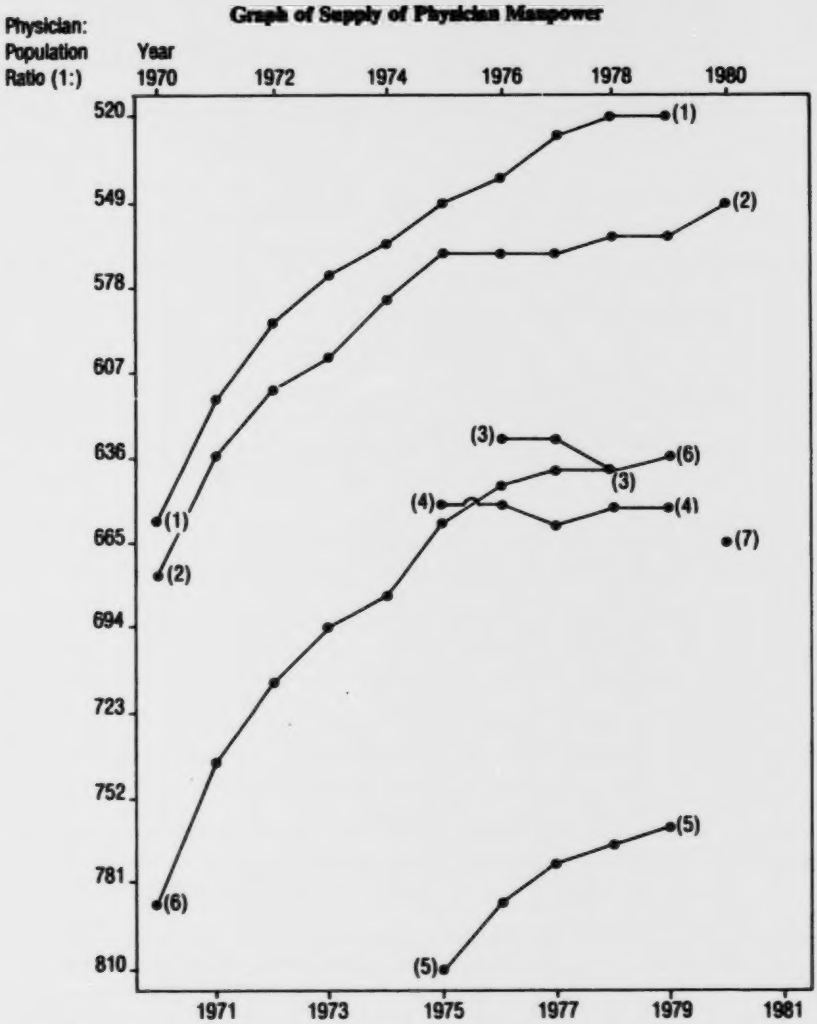
6. *Health and Welfare Canada:* The count developed by Sales Management Systems (SMS) and used by Health and Welfare Canada. This is a compendium of information gathered from many sources.

7. *Low Report:* The absolute number of active physicians for whom the discipline represents their major commitment (>50% of time) irrespective of their current role in administration, teaching and research in addition to patient care.

### Ratio of Population Per Physician Produced by the Seven Methods

| | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. C.P.S.O. Published Register | 1/658 | 1/619 | 1/590 | 1/574 | 1/561 | 1/550 | 1/538 | 1/527 | 1/521 | 1/520 | |
| 2. C.P.S.O. — MD's Residing in Ontario | 1/678 | 1/637 | 1/613 | 1/599 | 1/585 | 1/567 | 1/568 | 1/564 | 1/562 | 1/558 | 1/549 |
| 3. C.P.S.O. — Under age 65 | | | | | | | 1/630 | 1/632 | 1/640 | | |
| 4. OHIP — Total Billing | | | | | | 1/656 | 1/652 | 1/658 | 1/652 | 1/656 | |
| 5. OHIP — Billing over $10,000 | | | | | | 1/808 | 1/785 | 1/772 | 1/765 | 1/759 | |
| 6. Health and Welfare Canada | 1/784 | 1/741 | 1/712 | 1/695 | 1/681 | 1/659 | 1/650 | 1/643 | 1/644 | 1/634 | |
| 7. Low Committee | | | | | | | | | | | 1/665 |

**Graph of Supply of Physician Manpower**



**Legend:**

1. C.P.S.O. Published Register
2. C.P.S.O. MDs Residing in Ontario (Ministry of Health)
3. C.P.S.O. Under Age 65
4. OHIP Total Billing
5. OHIP Billing Over $10,000
6. Health and Welfare Canada
7. Low Committee

## Appendix 6

# Letter dated November 27, 1981

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November 27, 1981

Dr. J.B. Macdonald
Chairman
Task Force on Medical Manpower
Ontario Council of Health
700 Bay Street, 14th Floor
Toronto, Ontario
M5G 1Z6

Dear Dr. Macdonald:

I am replying to your request of November 9, 1981 for further clarification of Ministry objectives in reducing Ministry funded postgraduate posts by 2% on July 1, 1983, and 5% each year for the next three years.

Overall Ministry objectives in medical manpower planning were set out in my letter to you of November 6, 1981. Problems related to oversupply have been identified in Ontario and other provinces, and were emphasized in the Report of the Hall Commission.

I would like first to set out some of the more general considerations which influenced the decision. We recognized that perhaps half of the specialists trained in Ontario move to other provinces. Some other provinces (e.g. Quebec, Nova Scotia) are reducing postgraduate programs in an attempt to control their supply of specialists. However, Western provinces are maintaining manpower production; indeed British Columbia is expanding its medical school output. These factors suggested that specialists being trained in Ontario will likely not be required in other provinces in the numbers being trained at present. We also anticipated decreased emigration to the United States due to the developing oversupply of specialists in that country.

Increased numbers of physicians billing OHIP in 1980 compared to 1979, and increased numbers of hospital staff appointments, led to the conviction that resolute measures would be required if trends towards an oversupply of physicians in Ontario were to be reversed. The situation was becoming increasingly difficult to manage, and required stabilization.

The initial reduction of 2% for July, 1982, was intended to begin the process, delayed a year at the urging of the universities, and to permit the more definitive additional cuts of 15% to be accommodated over time by the universities and teaching hospitals.

More specifically, reductions in specialty training posts were intended to:

1. adjust specialty training so that in the long run not more than 45% of Ontario physicians are specialists.
2. improve the recruitment of qualified Ontario and Canadian applicants into specialties in short supply (e.g. anaesthesia, psychiatry).
3. through improved recruitment reduce the number of unsuccessful trainees, and improve the utilization of existing posts.

An effect, although not the primary intent, will be a small reduction in costs for postgraduate salaries and educational support. These savings may be offset by the costs of alternative means of providing for services.

The present target is a reduction over 4 years of 17% from the existing total of 2,502 Ministry funded posts. This translates into numerical reductions as follows:

July, 1982 — 50 posts
July, 1983 — 125 posts
July, 1984 — 125 posts
July, 1985 — 125 posts

I hope these remarks concerning Ministry objectives and policy decisions are useful in orienting the Task Force. We look forward to the results of your review. Kindest regards,

Sincerely,

Dennis R. Timbrell
Minister of Health

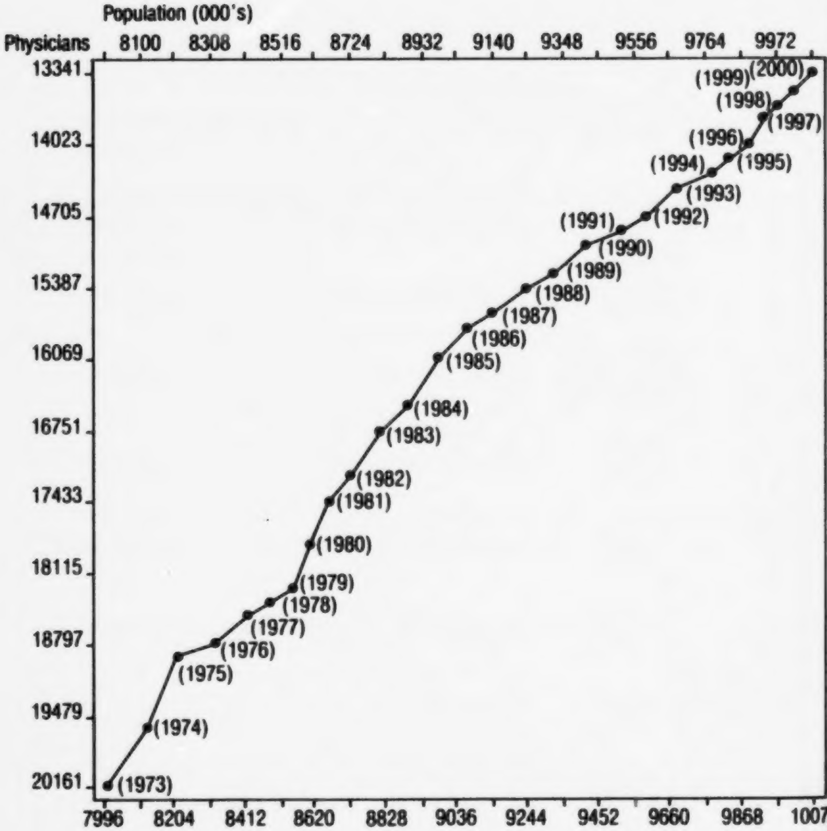
## Projection of Ontario Medical Manpower Supply (Residing in Ontario) to 2000
## Attrition dropped to 2.5% in 1981 and held to year 2000
## 175 FMG's retained

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Licensed from outside | | | | Attrition | | | End of Year Numbers and Rates | | | |
| Year | No. of Doctors Start of Year (Regular Register) | Total Potential Output From Ontario Medical Schools | Licensed from Ontario Schools on Regular Register | Doctors Trained in Other Provinces | Doctors Trained in Other Countries (1) | Total Outside Sources | Total new Registrants on Regular Register | Declining from 2.8% in 1980 to 2.5% in 1981 and maintained at that level to the year 2000 | Re-licences (after 1 or more years absence) | Total Regular Register | Estimated MD's on Special Register (Separate Projection) (2) | Grand Total MD's at yr. end (Reg. and Special) | Population 000's T & E Data February, 81 | Ratio |
| | | | | | | | ACTUAL | | | | | | | |
| 1973 | 12,133 | 473 | 366 | 102 | 321 | 423 | 789 | 315 | 33 | 12,640 | 701 | 13,341 | 7,998 | 1/599 |
| 1974 | 12,641 | 530 | 366 | 87 | 330 | 417 | 783 | 285 | 38 | 13,177 | 708 | 13,885 | 8,125 | 1/585 |
| 1975 | 13,177 | 548 | 340 | 98 | 266 | 364 | 704 | 181 | 29 | 13,729 | 794 | 14,523 | 8,229 | 1/567 |
| 1976 | 13,729 | 580 | 392 | 77 | 265 | 342 | 734 | 368 | 37 | 14,134 | 509 | 14,643 | 8,264 | 1/564 |
| 1977 | 14,134 | 580 | 358 | 106 | 223 | 329 | 687 | 486 | 48 | 14,466 | 461 | 14,927 | 8,358 | 1/560 |
| 1978 | 14,466 | 602 | 387 | 106 | 168 | 274 | 661 | 553 | 62 | 14,636 | 442 | 15,078 | 8,453 | 1/560 |
| 1979 | 14,636 | 606 | 345 | 104 | 188 | 292 | 637 | 409 | 37 | 14,901 | 406 | 15,301 | 8,546 | 1/558 |
| 1980 | 14,901 | 623 | 442 | 114 | 175 | 289 | 731 | 389 | 30 | 15,273 | 390 | 15,663 | 8,639 | 1/552 |
| | | | | | | | PROJECTED | | | | | | | |
| 1981 | 15,273 | 611 | 445 | 100 | 175 | 275 | 720 | 382 | 30 | 15,641 | 400 | 16,041 | 8,730 | 1/544 |
| 1982 | 15,641 | 608 | 445 | 100 | 175 | 275 | 720 | 391 | 30 | 16,000 | 400 | 16,400 | 8,822 | 1/538 |
| 1983 | 16,000 | 613 | 445 | 100 | 175 | 275 | 720 | 400 | 30 | 16,350 | 400 | 16,750 | 8,913 | 1/532 |
| 1984 | 16,350 | 612 | 445 | 100 | 175 | 275 | 720 | 407 | 30 | 16,691 | 400 | 17,091 | 9,002 | 1/527 |
| 1985 | 16,691 | 612 | 445 | 100 | 175 | 275 | 720 | 417 | 30 | 17,024 | 400 | 17,424 | 9,089 | 1/522 |
| 1986 | 17,024 | 612 | 445 | 100 | 85 | 185 | 630 | 426 | 30 | 17,258 | 385 | 17,643 | 9,175 | 1/520 |
| 1987 | 17,258 | 612 | 445 | 100 | 85 | 185 | 630 | 431 | 30 | 17,487 | 370 | 17,857 | 9,257 | 1/518 |
| 1988 | 17,487 | 612 | 445 | 100 | 85 | 185 | 630 | 437 | 30 | 17,710 | 355 | 18,065 | 9,338 | 1/517 |
| 1989 | 17,710 | 612 | 445 | 100 | 85 | 185 | 630 | 443 | 30 | 17,927 | 340 | 18,267 | 9,415 | 1/515 |
| 1990 | 17,927 | 612 | 445 | 100 | 85 | 185 | 630 | 448 | 30 | 18,139 | 325 | 18,464 | 9,490 | 1/514 |
| 1991 | 18,139 | 612 | 445 | 100 | 85 | 185 | 630 | 453 | 30 | 18,346 | 310 | 18,656 | 9,561 | 1/512 |
| 1992 | 18,346 | 612 | 445 | 100 | 85 | 185 | 630 | 459 | 30 | 18,547 | 295 | 18,842 | 9,628 | 1/511 |
| 1993 | 18,547 | 612 | 445 | 100 | 85 | 185 | 630 | 464 | 30 | 18,743 | 280 | 19,023 | 9,692 | 1/509 |
| 1994 | 18,743 | 612 | 445 | 100 | 85 | 185 | 630 | 469 | 30 | 18,934 | 265 | 19,199 | 9,752 | 1/508 |
| 1995 | 18,934 | 612 | 445 | 100 | 85 | 185 | 630 | 473 | 30 | 19,121 | 250 | 19,371 | 9,809 | 1/506 |
| 1996 | 19,121 | 612 | 445 | 100 | 85 | 185 | 630 | 478 | 30 | 19,303 | 235 | 19,538 | 9,862 | 1/505 |
| 1997 | 19,303 | 612 | 445 | 100 | 85 | 185 | 630 | 483 | 30 | 19,480 | 220 | 19,700 | 9,912 | 1/503 |
| 1998 | 19,480 | 612 | 445 | 100 | 85 | 185 | 630 | 487 | 30 | 19,653 | 205 | 19,858 | 9,959 | 1/502 |
| 1999 | 19,653 | 612 | 445 | 100 | 85 | 185 | 630 | 491 | 30 | 19,822 | 190 | 20,012 | 10,003 | 1/500 |
| 2000 | 19,822 | 612 | 445 | 100 | 85 | 185 | 630 | 496 | 30 | 19,986 | 175 | 20,161 | 10,045 | 1/498 |

1. These projections reflect the effect of elimination of graduates of Category 2 Schools from eligibility for licensing in Ontario. The average number licensed on the General Register from Category 2 schools for the known years 1978, 79 and 80 was 90 per annum. We have therefore reduced the average number of doctors trained in other countries (and licensed in Ontario) from 175 to 85 per annum, beginning in 1986.
2. The average number of doctors from Category 2 schools licensed on the Special Register was 15 for the years 1978–80. Gains and losses on the Special Register follow an entirely different pattern from the General Register, but broadly speaking had stabilized at about 40 gains and 40 losses per year, which maintained the Special Register at about the 400 level. If gains are reduced by 15 per year (Category 2 graduates), the Special Register will gradually decrease, dropping to 175 by the year 2000.

**Figure A**

**Graph of Physician Supply in Ontario**
**In Relation to Population**
**1973-2000**



**Physician Numbers Based on Ministry of Health Data Using C.P.S.O.**
**— MDs Residing in Ontario**

## TABLE 2

### Population Per Physician*
### in a Selection of
### Western Countries

| | Year | Population/Physician |
|---|---|---|
| Belgium | 1978 | 444 |
| Canada | 1977 | 563 |
| Denmark | 1976 | 512 |
| Finland | 1977 | 623 |
| France | 1976 | 613 |
| West Germany | 1977 | 490 |
| Ireland | 1976 | 831 |
| Italy | 1974 | 485 |
| Netherlands | 1977 | 583 |
| Norway | 1977 | 541 |
| Sweden | 1976 | 563 |
| U.K. — England & Wales | 1977 | 659 |
| Australia | 1976 | 650 |
| New Zealand | 1977 | 731 |
| U.S.A. | 1976 | 595 |

*Source:*
World Health Statistics Annual — Health Personnel and Hospital Establishments

*"all graduates of a medical school or faculty actually working in [a] country in any medical field (Practice, teaching, administration, research, laboratory, etc.)" p (iv)

## TABLE 3

### Population Per Physician
### Canada and the Provinces, 1980

| | Populations/Physicians* |
|---|---|
| Canada | 646 |
| Newfoundland | 853 |
| Prince Edward Island | 844 |
| Nova Scotia | 673 |
| New Brunswick | 958 |
| Quebec | 619 |
| Ontario | 626 |
| Manitoba | 660 |
| Saskatchewan | 780 |
| Alberta | 765 |
| British Columbia | 558 |

*Source:*
"Physician Stocks and Flows in Canada and by Province., 1973–1980" Health Economics and Data Analysis, Health Services Promotion Branch, Health and Welfare Canada 1981.

*The number of physicians "includes all active physicians in the provinces whether directly involved in medical care or employed in administration, teaching, research or other health-related activities. The stock does not include physicians who had died, were abroad, retired or in the military forces, or whose addresses were temporarily unknown. Interns and residents are not counted as part of the stock." The data was obtained by Health and Welfare from Sales Management Systems.

## TABLE 4

### Funding of Interns and Residents
### (Nov. 1, 1980)

| | MOH | Non-MOH | TOTAL |
|---|---|---|---|
| Interns | 659 | 4 | 663 |
| Residents | 1843 | 180 | 2023 |
| Fellows | 0 | 236 | 236 |
| TOTAL | 2502 | 420 | 2922 |

*ource:*
ntario Physician Manpower Data Centre, Post-graduate Registry

## TABLE 5

### Ministry of Health Funded Slots by Discipline for Ontario Medical Schools for 1978–79, 1979–80, 1980–81

| | 1978-79 | 1979-80 | 1980-81 |
|---|---|---|---|
| Anaesthesia | 131 | 137 | 140 |
| Community Medicine | 4 | 8 | 15 |
| Diagnostic Radiology | 106 | 110 | 110 |
| Family Practice | 187 | 191 | 194 |
| Gen. Internal Medicine | 268 | 256 | 259 |
| Cardiology | 26 | 25 | 27 |
| Clinical Immunology | 5 | 4 | 4 |
| Haem/Oncology | 14 | 17 | 18 |
| Dermatology | 16 | 17 | 14 |
| Endocrinology | 9 | 7 | 5 |
| Gastroenterology | 19 | 23 | 15 |
| Infectious Diseases | 2 | 2 | 1 |
| Nephrology | 6 | 6 | 7 |
| Neurology | 30 | 32 | 34 |
| Respirology | 15 | 13 | 16 |
| Rheumatology | 8 | 12 | 12 |
| Gen/Anat. Pathology | 99 | 101 | 94 |
| Haem. Pathology | 7 | 8 | 8 |
| Neuro Pathology | 7 | 7 | 8 |
| Med. Biochemistry | 7 | 8 | 8 |
| Med Micro | 14 | 10 | 13 |
| Nuclear Medicine | 5 | 7 | 6 |
| Obstetrics & Gynaecology | 95 | 100 | 95 |
| Ophthalmology | 44 | 45 | 47 |
| Otolaryngology | 32 | 34 | 32 |
| Paediatrics | 147 | 143 | 136 |
| Phys Med. & Rehabilitation | 32 | 35 | 36 |
| Psychiatry | 201 | 166 | 178 |
| Radiation Oncology | 18 | 12 | 14 |
| General Surgery | 110 | 115 | 95 |
| Card & Thoracic | 25 | 27 | 31 |
| Neurosurgery | 29 | 29 | 26 |
| Orthopaedic | 82 | 81 | 80 |
| Plastic | 22 | 22 | 22 |
| Urology | 38 | 42 | 40 |
| Emergency | 3 | 4 | 3 |
| TOTAL | 1863 | 1846 | 1843 |
| | Count date<br>Feb. 1979 | Count date<br>Nov. 1979 | Count date<br>Nov. 1980 |

*Source:* Ontario Physician Manpower Data Centre, Post-graduate Registry

## TABLE 6

### Apparent Ontario Benefit From Specialty Training Courses in Ontario Medical Schools
### Sample of 24 Specialties

| | **Average Number in Class Nov. 77** | **Completing RCPS Requirements - 78** | **Licensed** |
|---|---|---|---|
| Anesthesia | 33 | 25 | 10* |
| Diagnostic Radiology | 27 | 22 | 12 |
| Family Practice | 129 | 122 | —† |
| Obstetrics & Gynecology | 23 | 25 | 14 |
| Opthalmology | 12 | 17 | 9 |
| Otolaryngology | 10 | 13 | 4 |
| Phys. Med. & Rehab. | 5 | 4 | 1 |
| Psychiatry (1978?) | 66 | 51 | 24 |
| Radiation Oncology | 5 | 3 | 1 |
| Surgery | | | |
| General | 40 | 25 | 5 |
| Neuro | 5 | 4 | 1 |
| Ortho | 19 | 20 | 3 |
| Plastic | 7 | 8 | 2 |
| Urology | 9 | 10 | 3 |
| Laboratory Medicine | 36 | 30 | 12 |
| Internal Med. | | | |
| Immunology | 2 | 2 | 0 |
| Cardiology | 11 | 6 | —† |
| Dermatology | 7 | 7 | 5 |
| Endocrinology | 5 | 6 | 2 |
| Gastroenterology | 11 | 12 | 4 |
| Haematology | 5 | 6 | 3 |
| Infectious Dis. | 1 | 1 | 0 |
| Oncology | 3 | 3 | 3 |
| Rheumatology | 6 | 8 | 2 |
| Total | 477 | 430 | 120 |

*Estimate
†Not Available

*Source:*
Council of Ontario Faculties of Medicine Postgraduate Manpower Report — May, 1979

## TABLE 7

### Postgraduate Trainees According to Intended Place of Practice

| | Jan. '79 | | Feb. '80 | | Nov. '80 | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| Ontario | 1282 | 45 | 955 | 34 | 551 | 19 |
| Canada | 289 | 10 | 1026 | 36 | 1483 | 50 |
| Elsewhere | 305 | 11 | 328 | 12 | 329 | 11 |
| Undecided | 988 | 34 | 516 | 18 | 574 | 20 |
| Total | 2864 | 100 | 2825 | 100 | 2937 | 100 |

*Source:* Ontario Physicians Manpower Data Centre

## TABLE 8

### Specialists and Non-Specialists
### (Residing in Ontario)

### I Numbers on Register of the College of Physicians and Surgeons:

| | Specialist | | Non-Specialist | |
|---|---|---|---|---|
| Year | Number | Per Cent | Number | Per Cent |
| 1972 | 5,828 | 45.4 | 7,008 | 54.6 |
| 1973 | 5,896 | 44.2 | 7,445 | 55.8 |
| 1974 | 5,926 | 42.7 | 7,959 | 57.3 |
| 1975 | 6,405 | 44.1 | 8,118 | 55.9 |
| 1976 | 6,419 | 43.8 | 8,224 | 56.2 |
| 1977 | 6,611 | 44.3 | 8,316 | 55.7 |
| 1978 | 6,909 | 45.8 | 8,169 | 54.2 |
| 1979 | 6,866 | 44.9 | 8,441 | 55.1 |
| 1980 | 7,027 | 44.9 | 8,636 | 55.1 |

*Source:* C.P.S.O.

### I Numbers on OHIP Register

| | Specialist | | Non-Specialist | |
|---|---|---|---|---|
| Year | Number | Per Cent | Number | Per Cent |
| 1972 | 4,874 | 48.8 | 5,107 | 51.2 |
| 1973 | 5,068 | 48.4 | 5,404 | 51.6 |
| 1974 | 5,298 | 48.4 | 5,645 | 51.6 |
| 1975 | 4,573 | 44.2 | 5,768 | 55.8 |
| 1976 | 5,748 | 49.5 | 5,873 | 50.5 |
| 1977 | 5,791 | 49.5 | 5,938 | 50.5 |
| 1978 | 5,789 | 49.4 | 5,936 | 50.6 |
| 1979 | 6,080 | 49.3 | 6,248 | 50.7 |
| 1980 | 6,265 | 48.8 | 6,575 | 51.2 |

*ource:* Data Development and Evaluation Branch, MOH.

## TABLE 9

### Impact of Reduction of Numbers of MOH-Funded Intern & Residency Positions

| | **Direct/Immediate** | **Indirect/Subsequent** |
|---|---|---|
| **Education** | — decrease in or loss of "critical mass" in CTU | — decrease in teaching and supervision of M.D. students |
| | — loss of flexibility with electives, Academic Studies (because of increased service needs | — need for greater faculty involvement in teaching, supervision, direct patient care |
| **Research** | — pressure to assign funded positions to clinical activity to meet service/education needs<br>— loss of funded research year during residency | — need for external funding of research positions |
| | — pressure to decrease availability of short elective periods in research or horizontal research electives (because of pressure for patient care assignments) | — decrease or loss of opportunities for scholarly activity during residency |
| **Service** | — more pressure on fewer trainees to provide service coverage | — decreased time for thoughtful review of clinical activity, study, educational activities, supervision and teaching of M.D. students |
| | — pressure to cover critical care areas | — loss of education flexibility in terms of clinical assignments<br>— pressure to decrease allocation to less "needed" programmes. |

**Alternative Strategies to Approach the Problem**

- reduce number of trainees across all programmes on a prorated basis
- avoid the establishment of new programmes
- eliminate some established programmes
- reduce number of trainees in selected programmes
- establish conjoint programmes with other universities
- consolidate trainees where there is maximal educational payoff
- encourage a more vigorous approach to obtaining external funds for (i) residency training and (ii) research experience during residency
- develop alternative staffing patterns for certain patient care activities

*Source:*
Brief of Council of Ontario Faculties of Medicine to the Task Force on Medical Manpower

## TABLE 10

### Total Attrition, Net Emigration, Deaths and Retirement of Physicians in Ontario 1977–1980

| | Total attrition* | | Net emigration † | | Residual attrition (deaths & retirement) | |
|---|---|---|---|---|---|---|
| | Nos. | % | Nos. | % | Nos. | % |
| 1977 | 486 | 3.4% | 138 | 1.0% | 348 | 2.4% |
| 1978 | 553 | 3.8% | 309 | 2.1% | 244 | 1.7% |
| 1979 | 409 | 2.8% | 179 | 1.2% | 230 | 1.6% |
| 1980 | 389 | 2.6% | 125 | .8% | 264 | 1.8% |

*From CPSO register. See Table 1. Column 9

†Net emigration = physicians registered & resident in Ontario who leave the province *minus* physicians registered in Ontario and resident elsewhere who return to the province. This definition takes no account of immigration into Ontario. (Information from CPSO)

## TABLE 11

### A
### Projected Attrition Due to Death for Ontario Physicians Age Group 25–44, Period 1978–98

| Age Group | Nos. in Age Group (1978) | Percent Living To Term 20 Yrs. | Loss Over 20 Yrs. |
|---|---|---|---|
| 25–44 | 7,136 | 96.5 | 250 |

Average annual attrition = 12.5

Annual Rate = .18%

### B
### Projected Attrition Due to Retirement at Age 65, Ontario Physicians, 1978–98

**Total Ontario Physicians (1978)**

Age 25–44 — 7,136

Age 45–64 — 6,121

Total 13,257

Loss (20 year) due to death & retirement

(Age 45 and over) — 6,121

Average annual attrition — 306

Annual Rate = 2.31%

THEREFORE Annual Attrition Due to Death and Retirement 2.49%

# Membership of the Task Force on Medical Manpower

---

**Chairman:**

J.B. Macdonald, M.S., Ph.D., LLD.
Chairman, Addiction Research Foundation, Toronto
Vice-Chairman, Ontario Council of Health

**Members:**

A.N. Bourns, B.Sc., Ph.D., LLD, F.R.S.C.
Professor of Chemistry, McMaster University
Hamilton

E. Cruickshank, R.N., B.N., M.Sc.
Lecturer, Faculty of Nursing, University of Western Ontario, London
Associate Consultant, Woods, Gordon

H.C. Eastman, Ph.D.
Department of Political Science,
University of Toronto, Toronto

D.J. Grant, B.Sc., M.D., C.R.C.P. (C) (Dermatology)
Kitchener
Member, Ontario Council of Health

R.B. Holmes, M.D., M.Sc., LLD., F.R.C.P. (C)
(Radiology) (ex officio) Toronto
Chairman, Ontario Council of Health

R.M. MacMillan, M.D., C.C.F.P. (C) (Family Medicine)
Peterborough

P.J. Neelands, M.D., F.R.C.P. (C) (Paediatrics),
Thunder Bay

M. Paikin, B.A., LLD,
Burlington
Member, Ontario Council of Health

D.M. Schatz, Ph.D.,
Executive Director, Toronto Institute of Medical Technology,
Toronto

S. Skorcz, M.P.H. (Hospital Administration)
Executive Director, Capital Area Health Consortium,
Hartford, Connecticut.

# APPENDIX 1
# CONSULTANT'S REPORT

## Projection of Physician Supply and Demand in Ontario to the Year 2001

Final Report to

Task Force on Medical Manpower
of the Ontario Council of Health
October 1982

88084

Arthur D. Little, Inc.

# Acknowledgements

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To all of the above individuals we wish to express our gratitude. However, the responsibility associated for processing, analysis and interpretation of the information provided remains ours. Furthermore, the participation of the above-named persons does not in any way imply endorsement of our study or its results.

Judith D. Bentkover, Ph.D.
Project Director

A. James Lee, Ph.D.
Nancy Vakalis
Judith E. Green

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# I. Introduction

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In June, Arthur D. Little, Inc. embarked on a short-term study to assist the Task Force on Medical Manpower of the Ontario Council of Health in assessing the *present* and likely *future* adequacy of physician manpower in the Province of Ontario. In particular, the Task Force is concerned with projecting the supply of and demand for physicians to the year 2001. As part of an overall research strategy to develop useful information and analyses for developing policy options and recommendations concerning medical manpower over the next two decades, our study addressed two general questions:

- What are the factors which affect physician supply and demand in Ontario?
- What is the most probable evolution of the system based on current and/or currently projected trends and policies?

The answers to these two questions are of much interest and importance to the Ontario Council of Health as the senior advisory body to the Ministry of Health on health matters in Ontario. Taking our study findings into consideration, the Task Force will formulate conclusions and present them to the Council. After review, the Council will transmit the report as well as its recommendations to the Minister of Health.

Given the Task Force's need to achieve consensus on the physician manpower situation and prepare its report in the near future, our modeling strategy was predicated on the use of existing methodologies and data. Within the scope of our efforts were several activities:

- a critical evaluation of existing health manpower forecasting methodologies and alternative data sources;
- the development and application of an appropriate forecasting strategy vis-à-vis Ontario's data and medical care practice patterns; and
- the preparation of a report addressing methods, results, caveats and considerations regarding the sensitivity and appropriate use of the physician supply and demand projections.

We were directed to limit our attention to the *aggregate* supply and demand of physicians. Consequently, our study did not address specialty-mix and geographic distribution issues. Nor were we to assess the potential impact of technological developments and physician extender substitution on the physician requirements.

This Final Report concludes our activities on behalf of the Task Force. It is organized as follows. In Section II we present our approach for measuring the full-time active supply of physicians in Ontario and report the results of implementing that approach. In Section III, we develop projections of the future physician supply in Ontario to the year 2001. These projections are discussed vis-à-vis underlying assumptions, variable definitions, data sources, and caveats relating to interpretation and use of the results. A variety of alternative scenarios are presented. In Section IV, we use OHIP utilization data to project the physician requirements to the year 2001. These requirement estimates are then compared and contrasted with the supply projections. In Section V we use the so-called Michigan model to estimate the physician manpower requirements in Ontario under the assumption that HMO or pre-paid practice patterns prevail. Finally, in Section VI we give a brief summary of study findings.

# II. Measuring the Full-Time Active Physician Supply

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The Task Force initially identified seven alternative measures of the physician manpower supply in Ontario:

1. C.P.S.O. Published Register
2. C.P.S.O. MDs Residing in Ontario
3. C.P.S.O. Under Age 65
4. OHIP Total Billings
5. OHIP Billings Over $10,000
6. Health and Welfare Canada
7. Low Committee

Thus, a first study question concerned which source or combination of sources provided the most dependable indicator of the *full-time active* physician supply.

We quickly concluded that for Task Force purposes physician supply is most usefully measured from the OHIP billing data. Our reasoning is as follows. One can systematically model and estimate the number of physicians required to provide *direct* patient care services. However, one cannot similarly estimate in systematic fashion the number of physicians required for nonpatient care activities (e.g., teaching, research and administration). Thus, for modeling and predictive purposes it is essential to focus on physicians providing patient care services. Unlike other alternative definitions (e.g., C.P.S.O. and Low Committee) the OHIP data only reflects physicians falling into this category.

The OHIP billing data not only serves to distinguish physicians providing patient care services but also gives proxy information on the relative intensity of the physicians' patient care activities. In particular, it indicates the numbers of physicians with total annual billings falling within $10,000 payment intervals—e.g., the number of physicians billing less than $10,000 per year, the number of physicians billing $10,000 to $20,000 per year, the number of physicians billing $20,000 to $30,000 a year, etc. The actual OHIP billing distribution for FY 1981 is shown in Exhibit 1. It was obvious from examining this and similar distributions for other years that many of the physicians billing OHIP are not providing patient care services on a full-time basis. For example, more than ten percent of the physicians represented in Exhibit 1 had billed less than $10,000 during the year. Consequently, we recommend the following general formula for determining the *full-time equivalent* number of physicians billin OHIP ($FTE_{OHIP}$):

$$FTE_{OHIP} = N_y + \sum_i N_i \left(\frac{x_i}{y}\right)$$

where:

$y$ is the billing threshold above which anyone is counted as working full-time;

$N_y$ is the number of physicians billing in excess of the *y* threshold amount;

$x_i$ is the average amount billed within each $10,000 billing interval where $x_i < y$;

$N_i$ is the number of physicians in the *i* th billing cohort.

Basically, anyone who bills more than the minimal threshold amount is counted as workin full-time in patient care and anyone who bills less than the threshold amount is counted as working part-time. Those counted as working part-time are then weighted by the ratio between the actual amount billed and the threshold amount. If, for example, a physician bills 80 percent of the threshold amount, that physician is considered to be providing 0.80 full-time equivalents of patient care services.

After considerable discussion, the Task Force decided at its June 28 meeting that most any physician working full-time at patient care would have billed at least $80,000 for FY 1982. Thus, we adopted $80,000 as the threshold amount pertaining to FY 1982.[1] To obtain equivalent threshold amounts pertaining to prior years (see Table 1), we simply adjusted the FY 1982 figure for physician fee inflation using a physician fee index calculated from the 1982 Weiler report.

The estimated numbers of full-time equivalent (FTE) physicians billing OHIP in each of nine years, FY 1973 through FY 1981, are shown in Table 2.[2] Our results indicate that the FTE number of physicians billing OHIP was nearly 10,000 in FY 1981 and growing at the rate of 2.0 to 2.5 percent per year. However, our formula does not take account of OHIP services rendered by interns and residents. The services provided by interns and residents are billed to OHIP under the supervising physicians I.D. number and our formula only counts the supervising physicians; it does not consider those billing more than the threshold amount as working more than full-time. Consequently, we also add the full-time equivalent number of interns and residents to the $FTE_{OHIP}$ base.

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[1] The Task Force subsequently considered that it might have been more appropriate to indicate different thresholds for general practitioners and specialists. We do not believe that this refinement would have made much difference.

[2] Laboratory (i.e., nonphysician) services were also included in the OHIP billing data for FY 1977 and before. This meant that our FTE formula overestimated the number of full-time equivalent physicians in those years. The estimates were adjusted on the basis of differences found in subsequent years when the FTE numbers could be calculated in both ways (i.e., both including and excluding laboratory services).

Following GMENAC, we consider that each intern or resident is providing 0.35 full-time equivalents of patient care services.[3] Thus, as seen in Table 2, the total number of full-time equivalent physicians providing OHIP services in 1980–1981 was 11,016.

Although the OHIP billing physicians, interns, and residents account for the largest part of patient care services provided to the population of Ontario, patient services are also provided under various alternative financing and institutional arrangements. For example, the $\text{FTE}_{\text{OHIP}}$ estimates do not reflect physicians on the staffs of public hospitals, Federal hospitals and children's and mental retardation facilities. Nor do they include those reimbursed on an HSO or other alternative payment basis. The total estimated number of FTE physicians providing patient care services in FY 1981 is estimated in Table 3.[4] Our results show that Ontario currently has roughly 14,000 physicians working full-time (or rather on a full-time equivalent basis) in patient care. This number is about 30 percent greater than the total FTE number of physicians providing OHIP services. Unfortunately, similar estimates could not be developed for prior time periods because the necessary data were not available.

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[3] The GMENAC reports do not document the basis for making this assumption except to say that it is based on the level of services actually provided. Thus, interns and residents probably spend a much greater proportion of their time in patient care activities since they no doubt work less efficiently than the average full-time practitioner.

[4] Part-time physicians (e.g., part-time physicians in public hospitals) are somewhat arbitrarily counted as working half-time.

# III. Projecting the Future Physician Supply

In this section we model, as well as we can, the factors affecting the physician supply in Ontario and use the resultant model to project physician supply to the year 2001. We seek to develop the best possible model given the data available. However, it is important to understand that our approach was significantly shaped and constrained by data limitations.

Our general approach is to use historical data in developing an interactive simulation model that generalizes historic patterns or relationships into the future. Whereas we employ statistical techniques to discern these underlying relationships, the Task Force has noted that several criteria of interest (e.g., the number of graduates and the number of immigrants) are substantially determined or fixed by government policy. We do not deny this. On the other hand, analysts often find that government policies are not exogenous, but rather that they are ultimately determined by the underlying causal factors seen from historic variation. In any event, it is improbable that the government's current policies will remain unchanged to the year 2001. We nevertheless agree that it is important to understand the sensitivity of the simulation results to different assumptions and develop physician manpower projections under a variety of alternative scenarios, including scenarios that entail continuation of present government policies.

Exhibit 2 gives a useful summary of key elements in our approach to modeling the physician supply. As a matter of definition, the physician supply varies from year to year because of *additions* to and *subtractions* from the stock or supply at the beginning of each year. Furthermore, in principle, the "additions" and "subtractions" can be decomposed into several components—e.g., new graduates and immigrants for the "additions" and emigrants, deaths and retirements for the "subtractions." Unfortunately, information of this kind could only be obtained on a C.P.S.O. registry basis (i.e., in terms of additions to and subtractions from the C.P.S.O.-registered number of physicians) whereas the physician requirement, as discussed in Section II, is more usefully measured in terms of the $FTE_{OHIP}$ definition. We had no choice but to model and project physician supply on a C.P.S.O. basis and then apply a conversion factor ($FTE_{OHIP}$ / CPSO) in order to estimate the full-time equivalent number of physicians likely to provide OHIP-paid services in the future. Consequently, we also model and project the $FTE_{OHIP}$ / CPSO ratio.

Our approach to modeling the C.P.S.O. components required some modification subsequent to its presentation at the June 28 meeting. In particular, we discovered that the "subtractions" variable could not be disaggregated into its components (e.g., emigration, deaths and retirements) for years prior to 1979. Furthermore, the disaggregations available for 1979, 1980 and 1981 appeared to be unreliable. We were concerned, for example, that deaths are inadvertently counted among the memberships cancelled for nonpayment of dues. We thus were reduced to modeling the following three components:

1. the number of Ontario graduates registered;

2. the number of non-Ontario graduates registered; and

3. total "subtractions."

We actually model the first component using a two-step procedure, modeling first the number of Ontario graduates in any given year and then modeling the proportion of this number that register with C.P.S.O. The second component is basically an immigration variable. However, it does not include all immigrants. Those physicians formerly registered with C.P.S.O. and returning to Ontario are supposed to have been netted (or deducted) from the "subtractions" variable. However, it appears that some of them were also included in the re-registrants variable and furthermore that the categorization itself was inconsistent from year to year. Also, some of the re-registrants may simply be renewing their memberships after having been canceled for nonpayment of dues. Consequently, we have deducted re-registrants from "subtractions" as reported by C.P.S.O. to obtain an adjusted "subtractions" variable that we believe to be more meaningful. Finally, in addition to modeling the C.P.S.O. "additions" and "subtractions" we also model the number of physicians on the special register.

### A. Model Results

The model specifications and results are presented separately below for each of the variables being modeled. In each instance, we are basically looking for historical patterns or trends in the data that can then be generalized or extrapolated to the future. Although much of the data was available back to the mid-1960s, the data series used in our analysis began in 1971. We wanted to avoid having the results unduly influenced by experience so remote from the present. Also, TIME and log (TIME) variables were used for estimating trend relationships rather than TIME and TIME SQUARED as initially planned. The latter specification was found to give less satisfactory results. The models reported below were estimated by ordinary-least-squares (OLS) and a stepwise selection algorithm was used to assure that only relatively significant variables were included in the relationships used for simulation purposes.

#### 1. *Ratio of Full-Time Equivalent OHIP Physicians to C.P.S.O. Registered Physicians* ($FTE_{OHIP}/CPSO$).

We simply modeled the time trend in this variable and obtained the following results:[5]

$$FTE_{OHIP}/CPSO = .599 + \underset{(.00297)}{.0448} * \log(TIME)$$

$R^2 = .974$
$F = 227$

As can be seen, only one of the two time variables was sufficiently significant to remain in the model.

---

[5] The standard errors are given in parenthesis. The $R^2$ represents the proportion of variation in the dependent variable explained by the model (i.e., the goodness of fit). The F-statistic indicates the statistical validity of the overall model.

The actual values of $FTE_{OHIP}/CPSO$ for 1971–1981 are presented in Table 4 along with representative projections of that parameter to the year 2001 that derive from the model. The model indicates that $FTE_{OHIP}/CPSO$ gradually increases from .6934 in 1981 to .7528 in 2001. Thus, the *effective* physician supply is predicted to grow at a faster rate than the number of C.P.S.O.-registered physicians.

2. *Ratio of Ontario Graduates to Population (GRADS/POP).*

We also modeled only the time trend in this variable. Although the ratio is undoubtedly sensitive to the physician market situation in Ontario, we lacked sufficient data for meaningful specification of the dynamic (i.e., lagged response) relationship.

$$\begin{aligned} GRADS/POP = .0484 &- \underset{(.000695)}{.000947} * TIME \\ &+ \underset{(.00309)}{.0139} * \log(TIME) \end{aligned}$$

$$\begin{aligned} R^2 &= .929 \\ F &= 52.7 \end{aligned}$$

Only the log (TIME) variable is significant at the 0.10 level. The TIME variable is significant at the 0.21 level, an acceptable degree of precision given the small sample size involved.

The projected results, some of which are shown in Table 4, indicate that the ratio rises to a maximum of .0718 in 1984 and then declines to .0668 by 2001. Given widespread concerns about a potential future surplus of physicians, it is not unreasonable to anticipate that medical school output will not keep pace with population. Consequently, we judge that these results are reasonable.

3. *Proportion of Ontario Graduates Registering (LIC/GRADS).*

We hypothesized that the numbers of graduates remaining in Ontario might in part depend upon earnings opportunities in Ontario relative to the other Provinces. We thereupon included a relative earnings variable (SAL) in this model, as well as TIME and log (TIME).[6] Only the log time variable was sufficiently significant to remain in the model; and it is significant at better than the 0.10 level.[7]

---

[6] The SAL variable was defined as the ratio of average after-tax earnings for physicians living in Ontario to average after-tax earnings for physicians living elsewhere in Canada. This variable was developed by applying average tax rates for medical doctors and surgeons in each Province to the average benefit indices reported in Table II (p. 15) of the 1982 report of the Joint Committee on Physicians' Compensation for Professional Services (the so-called Weiler Report).

[7] Since the Task Force felt that the LIC/GRADS ratio of .560 for 1979 was anomalous, that observation was omitted in final estimation of the model.

$$\text{LIC/GRADS} = 0.884 - \underset{(0.0305)}{0.109} * \log(\text{TIME})$$

$$R^2 = 0.646$$
$$F = 12.8$$

The proportion of variation explained is not nearly so high for this relationship—i.e., the "fit" to the data is not as good as that obtained for the other models. Thus, we know that the predictions obtained from this model will be less dependable.

The projections derived from this model indicate that the proportion of graduates remaining in Ontario falls from 0.794 in 1981 to 0.510 in 2001. This suggests that in the future Ontario will "export" an increasing fraction of its graduates to other Provinces and possibly also the United States. The Task Force judged this to be improbable given the apparent burgeoning surplus of physicians within the United States and throughout Canada. Indeed, recent data suggest that there may have been an undetected "turning point" in the relationship. The LIC/GRADS ratio declined steadily (see Table 4) from 1971 to 1979; however, the ratio is sharply higher in both 1980 and 1981. The Task Force concluded that the near-term experience is likely to be a more reliable guide to the future and consequently we have used the 1980–81 average of 0.768 as the value of the LIC/GRADS ratio for general simulation purposes.[8]

### 4. *Non-Ontario Graduates Registering as a Proportion of Total C.P.S.O. Registration (IMMIG/CPSO).*

We consider that this variable might vary not only with time but also with the relative earnings otential (SAL) and the pre-existing physician-population ratio (CPSO/POP). However, only the physician-population variable remained in the model; it is significant at an extremely igh level.

$$\text{IMMIG/CPSO} = 0.226 - \underset{(0.0124)}{0.117} * \text{CPSO/POP}$$

$$R^2 = 0.917$$
$$F = 88.3$$

he value of this parameter at any point in the future is calculated in an interactive fashion, ased upon the C.P.S.O. projection for the previous period. As shown in Table 4, our results ggest that the rising physician-population ratio in Ontario will cause "immigration" to fall om 1.9 percent currently to about 1.2 percent by 1986 and that the parameter will remain at ughly that level to the year 2001.

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All simulations were also done using the LIC/GRADS projections, and those results are available from the tario Council of Health.

### 5. *Subtractions as a Proportion of Total C.P.S.O. Registration [(ATTRIT-RELIC)/CPSO]*.

In this model we included the earnings (SAL) and physician-population ratio (CPSO/POP) variables as well as the time trend variables. Only the earnings variable was found to be reasonably significant. It is significant at roughly the 0.10 level.

$$\text{(ATTRIT-RELIC)/CPSO} = .137 - \underset{(.000718)}{.0013} * \text{SAL}$$

$R^2 = .290$
$F = 3.28$

The "goodness of fit" obtained is not impressive. This, however, is not surprising given the rather amorphous nature of the variable itself (i.e., it includes not only deaths, retirements and emigration but also nets some immigrants). The results are nevertheless consistent with expectations, signaling that an increase in fees produces a reduction in attrition (e.g., delayed retirement or reduced emigration).

The estimates indicated in Table 4 for the future value of this parameter are predicated on the assumption that the current fee situation will continue indefinitely. This implies that "attrition" will remain constant at 2.74 percent over the foreseeable future.

### 6. *Ratio of Special Register to General Register (SPECIAL/GENERAL)*.

We only modeled the time trend in this variable. In addition, we only used data from 1976 on. As seen in Table 4, the level of this variable fell abruptly in that year, and we decided that it made more sense to model only the most recent experience.

$$\text{SPECIAL/GENERAL} = .0774 - \underset{(.00141)}{.0211} * \log(\text{TIME})$$

$R^2 = .987$
$F = 224$

We obtain an excellent "fit" to the rather short data series.

The projections obtained from extrapolating recent experience imply that the importance of the special registry will continue to fall sharply. In particular, we calculate that the ratio will decline from 2.6 percent in 1980 to 0.5 percent in 2001.

## B. Physician Supply Projections to the Year 2001

The models estimated above are now used to simulate or project the future physician supply. The projections are developed in interactive fashion. We have the C.P.S.O. physician stock general registry in the beginning of the year and the models are used to estimate or forecast the "additions" to and "subtractions" from this initial stock as well as the number of physicians on the special registry. This information then permits us to determine the physician stock at the end of the year, which is also the stock at the beginning of the subsequent year. The $FTE_{OHIP}/CPSO$ model is used to convert C.P.S.O. stock to $FTE_{OHIP}$ equivalents. The relationships are interdependent in the sense that several components depend upon the C.P.S.O. stock at the beginning of the year. If, for example, the number of graduates is reduced in year *t*, that also has an impact on immigration in year $t + 1$ (and later) since the predicted IMMIG/CPSO ratio gets multiplied by CPSO to determine the actual number of immigrants.

In actuality, a variety of different simulations are reported below. We not only use the projected models to extrapolate historic experience ("the base model") but also vary selected model parameters to ascertain the sensitivity of the model to alternative assumptions.

### 1. *The Base Model.*

The estimated relationships were used in straightforward fashion to simulate or project the future physician supply in Table 5 for each individual year to the year 2001. The results indicate that the population-C.P.S.O. physician ratio will continue falling, albeit very slowly, and nearly stabilize by the end of the century. On the other hand, the more relevant population-$FTE_{OHIP}$ ratio is projected to fall by about ten percent between 1981 and 2001. By comparison, between 1972 and 1980—a much shorter time interval—the ratio fell about 17 percent.

The so-called base model in Table 5 does not incorporate the estimated LIC/GRADS model. Recall that the relationship was judged to be implausible and that we have instead fixed the ratio of the average of its value for 1980 and 1981. We have also run the base model without imposing this assumption in order to assess the magnitude of its impact on the projections. Those results are shown in Table 6. Although that simulation indicates a somewhat reduced physician supply in the year 2001 vis-à-vis the base model in Table 5, the differences are rather small.

### 2. *Alternative Scenarios.*

We simulate a variety of alternative scenarios in Tables 7 (a) through 7 (i). These alternative scenarios help to bracket the likely range of future physician manpower supply and distinguish those assumptions to which the model is most sensitive. The assumptions made in each of these simulations are indicated below:

Table 7(a)—Assumes that the number of graduates is constant at 606.

Table 7(b)—Assumes a 15 percent reduction in the number of graduates.

Table 7(c)—Assumes a 15 percent increase in the number of graduates.

Table 7(d)—Assumes that the ratio of graduates to population is constant at .0695.

Table 7(e)—Uses the Task Force's Phase I immigration assumptions (IMMIG = 275 for 1981–1985 and IMMIG = 185 for 1986–2001).

Table 7(f)—Assumes that the ratio of immigrants to C.P.S.O. physicians is constant at .0188.

Table 7(g)—Assumes that fees rise to the national average level.

Table 7(h)—Assumes that Ontario fees return to 1972 position vis-à-vis the national average.

Table 7(i)—Assumes a 15 percent increase in the number of graduates and that the ratio of immigrants to C.P.S.O. physicians is constant at 0.0188.

The impact of imposing these additional constraints on the model is most easily seen by comparing the physician supply projected for 2001 with that projected by the "base model" in Table 5. The various alternative assumptions can be categorized into three broad groups—those having a "nominal" (less than 5 percent) impact on the results, those having a "moderate" impact (5 to 10 percent) on the results, and those having a "major" impact (more than 10 percent) on the results.

All of the scenarios that incorporate alternative assumptions about the numbers of graduates fall into the first category. That is, the physician supply appears to be relatively insensitive to variation in the numbers of physicians graduating from Ontario medical schools. We also estimate, in Table 7(g), that it would not make much difference if fee levels were to increase to the national average. According to the Weiler Report, the Ontario fee level in 1981 was about five percent below the national average.

The immigration assumptions developed by the Task Force in its Phase II report are imposed on the model in Table 7(e). In particular, the number of immigrants is projected to fall by 85 after 1986 because graduates of Category 2 schools will no longer be eligible for licensure. This assumption has a "moderate" impact on the results. The C.P.S.O. physician supply projected for 2001 using this assumption is 8.5 percent greater than that projected in the "base model." This is not surprising given that immigration is basically assumed to be insensitive to the physician supply situation.

Only three of the nine alternative scenarios are found to indicate what we regard as "major" variances from the base model. (1) If, as in Table 7(f), the immigration rate is assumed constant at the level prevailing in 1980 we calculate that the physician supply resulting in 2001 will exceed that predicted from the base model by 22 percent. However, given present government policy with respect to Category 2 schools, we doubt that this circumstance would occur. Nevertheless, the result points up the importance of monitoring immigration; it is unquestionably an important policy variable.

In Table 7(i) we assume not only that the immigration rate is constant but also that the number of Ontario graduates is increased by 15 percent. Here again, an increase in the number of graduates does not make an important difference. The physician supply projected in 2001 is only 3.5 percent greater than was projected in Table 7(f), wherein it is merely assumed that the immigration rate is constant.

Finally, as seen in Table 7(h), we project that the physician supply in 2001 would be about 21 percent greater if fees were returned to the position vis-à-vis other Provinces that prevailed in 1972 (i.e., at the time OHIP was instituted). We do not however have a lot of confidence in those results. Statistical models are much less stable in projecting to the limit of observed variation in the data.

In the next section we estimate the physician requirements to the year 2001 and compare those requirements with the supply estimates developed here.

# IV. Using OHIP Utilization Data to Project Physician Requirements

Although many different methodologies have been put forward for determining physician manpower requirements, the various alternatives fall into two basic categories:

1. need-based models, and

2. demand-based models.

The two types of models can be distinguished as having fundamentally different objectives—i.e., they are designed to answer altogether different policy questions. A "need-base" approach determines physician requirements consistent with the level of care that someone thinks people *should have*. A "demand-based" approach, on the other hand, determines physician requirements consistent with the amount of health care that people *actually demand* and receive. The demand- or utililization-based approach essentially tells you how many physicians will be required in the future if the present structure and policies of the health care system are maintained. The need-based approach, on the other hand, tells you how many physicians will be required if the structure and policies of the health care system are somehow changed so as to eliminate both over- and under-utilization of health care services (however defined).[9]

In this section, we develop and apply a utilization-based model to project the future physician manpower requirements in Ontario. In particular, we estimate the numbers of full-time equivalent physicians that will be required to provide OHIP-paid services in 1991 and 2001.

Our utilization-based methodology for projecting the physician requirements basically entails two steps:

1. projecting the future level of OHIP-paid health care services; and

2. using provider productivity assumptions to estimate the number of full-time equivalent physicians required to provide those services.

However, actual implementation of this methodology is somewhat indirect in the sense that, we first estimate the number of full-time equivalent physicians required to provide the current level of OHIP-paid services and then adjust this estimate to take account of anticipated increases in the future health care utilization as well as anticipated changes in physician productivity.[10]

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[9] See Lomas and Stoddart (1982) for an excellent review of the conceptual and practical differences between the two approaches.

[10] This is the same general approach as that taken by Requirements Committee of the National Committee on Physician Manpower (1975).

## A. Estimating The Number Of Full-Time Equivalent Physicians Required To Provide OHIP-Paid Services In 1980

Our first step is to estimate the number of full-time physicians *required* to efficiently provide OHIP-paid services in the base year of 1980. In Section II, we have already estimated the umber of full-time equivalent physicians *actually* providing OHIP-paid services in that year. That estimate was developed without reference to physician productivity or practice standards (i.e., how long it *should* take to provide the services). The estimates may be different to he extent that physicians are either working inefficiently and producing too few services in he time available, or less likely, working too quickly (i.e., not maintaining appropriate linical practice standards) and producing too many services.

We are using the workload or productivity standards developed by the Requirements Com- ittee of the National Committee on Physician Manpower (1975). The Requirements Com- ittee organized physician "working parties" to represent general practice and each of 32 edical specialties. The working parties were asked to develop the best possible consensual stimates for the average service time associated with each of 13 service categories (as appro- riate to each specialty):[11]

1. Consultations
2. Complete examinations
3. Office visits
4. Hospital visits
5. Home visits
6. Major surgery
7. Minor surgery
8. Surgical assistance
9. Obstetric services
10. Anesthesia
11. Diagnostic radiology
12. Other diagnostic/therapeutic services
13. Miscellaneous services.

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The kinds of services included within each of these broad categories are indicated in Appendix A. Laboratory rices are excluded.

The working parties were asked to estimate both the *direct* and *indirect* service times, in minutes, for each service category. The direct service time is that required for actual provision of the service, and the indirect service time is that required for other activities associated with delivery of the service (e.g., waiting, telephoning, writing reports or reading x-rays).

In Appendix B, Table B-1, we indicate the specialty-specific service time requirements as reported by the working parties of the Requirements Committee. Since psychotherapy is billed on an actual time basis in Ontario, we have broken it out as a separate service category. On this same table, we also indicate the specialty-specific distribution of OHIP-paid services for 1979–1980 using the same service categorization scheme. (See Appendix B for details, including details on reclassification of OHIP service categories into the categories used by the Requirements Committee.) For each specialty and each service (excluding laboratory services), the time requirement per service is multiplied times the number of OHIP-paid services to estimate the total time requirement for specialists providing the service. These specialty- and service-specific time requirements are then aggregated to give the total time requirement for each service as well as the aggregate time requirement for all services. This and other more aggregate information developed in Table B-1, Appendix B, are summarized below in Table 8.[12] In particular, it also indicates the weighted average time requirement for each service.

As seen in Table 8, we estimate that 1,577,287,384 physician-minutes (or 26,288,123 physician-hours) should have been required to provide OHIP-paid services in 1979–1980. Based on a survey conducted by the Ontario Medical Association, we calculate in Table 9 that OHIP-paid Ontario physicians worked an average of 2,565 hours per year in 1980 (excluding on-call time). The full-time equivalent physician requirement ($\mathrm{FTE}_{\mathrm{REQ}}$) is then obtained as shown below:

$$\mathrm{FTE}_{\mathrm{REQ}} = \frac{\text{1,577,287,384 minutes}}{\text{(2,565 hours per physician-year) * (60 minutes per hour)}}$$
$$= \text{10,249 physicians}$$

That is, we estimate that 10,249 full-time equivalent physicians were required to provide OHIP-paid services in 1979–1980. On the other hand, in Section II we estimated that the full-time equivalent number of physicians billing OHIP was 10,742 or about 4.8 percent more than the apparent requirement. This differential could arise for any of several reasons. It could signal the existence of some inefficiency in physician practice, but we doubt it. More likely, it reflects a combination of two factors:

1. the time required for other, non-OHIP-paid services (e.g., Workmen's Compensation); and

2. potential over-reporting of the actual number of hours worked by physicians.

The differential would be eliminated if, for example, the actual average number of hours worked per year were 2,447 (still more than 50 hours per week worked) instead of 2,565. On balance, we believe that the actual FTE physician supply of 10,742 in 1980 was appropriate given the services provided, and consequently that figure is used as the base in projecting future physician requirements.

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[12] Total service time requirements were not obtained on a specialty-specific basis. The study only examines aggregate physician supply and demand and does not give attention to specialty mix issues.

## B. Projecting The Physician Requirements In 1991 And 2001

### 1. *Adjustment Factors.*

We accept above that 10,742 is a reasonable estimate for the full-time equivalent number of physicians required to provide OHIP-paid services in 1979–1980. We now estimate the FTE physician requirements in 1991 and 2001 by adjusting this 1980 requirement for relevant differences between that base year and future time periods. Four adjustment factors are developed and used for this purpose:

1. a population adjustment factor,
2. an age adjustment factor,
3. a female productivity adjustment factor, and
4. an hours-worked adjustment factor.

The first two factors adjust for anticipated future increases in the demand for OHIP-paid services, and the second two factors adjust for anticipated future changes in physician productivity. Each of the four factors is briefly described below.

POPULATION ADJUSTMENT FACTOR. The population adjustment factor gives a "first approximation" adjustment for the anticipated future increase demand for health care services. If neither the age distribution nor age-specific utilization rates varied over time, the future demand for health care services would vary proportionally with population size. Thus, the population adjustment factor is simply defined as the ratio of future to base year population. The population of Ontario in 1991 is projected to be 8.5 percent greater than it was in the base year of 1980, and the population in 2001 is projected to be 11.5 percent greater.

AGE ADJUSTMENT FACTOR. The age adjustment factor permits a more refined estimate of the likely future increase in OHIP-paid health care services. Population projections indicate that the age distribution of the population is shifting towards older-age cohorts. Inasmuch as older persons are known to use relatively more health care services, this "aging" of the population means that the demand for OHIP services will increase at a greater rate than the rate of population increase. In Table 10 we take the per capita expense as a proxy for health care utilization and develop adjustment factors that reflect the impact of aging on the per person utilization rates in 1991 and 2001. In 1980 the average per capita expense was $119.16. If the age-specific per capita amounts for 1980 (e.g., the average per capita costs for persons aged 45 to 49, persons aged 50 to 54, etc.) are reweighted by the projected 1991 age distribution the average per capita expense in 1980 would have been $126.06. We similarly calculate that the per capita cost would have been $130.16 using the age distribution expected in the year 2001. Thus, if age-specific utilization rates (as proxied by expense) remain unchanged, the above results imply that the average utilization rate in 1991 will be 5.8 percent greater than that in 1980 and that in 2001 it will be 9.2 percent greater.

FEMALE PRODUCTIVITY ADJUSTMENT FACTOR. An increasing proportion of medical school graduates are female. Between 1965 and 1981 the percentage of graduates from Ontario medical schools who are female increased from 11.5 percent to 30 percent. Furthermore, both the 1980 Manpower Survey of the Study Group for Family Medicine in Ontario and a recent survey conducted by the College of Family Physicians of Canada find that female physicians in Ontario currently work 75 percent as many hours as male physicians. If female physicians continue to work fewer hours, the increasing female composition of the physician workforce implies that average physician productivity will decline and that a greater number of physicians will be required in the future to provide a given level of services.

Assuming that 35 percent of additions to the physician supply are female, we project, as shown in Table 11, that the percentage of physicians in Ontario who are female will increase from 12.8 percent in 1980 to 20.7 percent in 1991 and that it will increase to 24.6 percent in 2001. In Exhibit 2, we indicate the calculations for "efficiency" factors to be used in adjusting the physician requirement for female productivity differences. Inasmuch as female physicians work three-quarters as many hours as male physicians, they are considered to have an efficiency or productivity factor of 0.75 compared to 1.00 for males. An overall efficiency factor is then calculated as a weighted average of the male and female efficiency factors, For example, we calculate in Exhibit 1 that the physician workforce in 1980 was 96.8 percent as productive as it would have been if the entire physician workforce were male. Furthermore, assuming that female physicians continue to work three-quarters as many hours, we calculate that in 1991 the workforce will be 94.8 percent as productive relative to a hypothetical all male workforce and that in 2001 it will be 93.8 percent as productive. These calculations imply that a 2.1 percent greater supply of physicians will be required in 1991 due to male/female productivity differences and that a 3.2 percent greater supply will be required in 2001.

On the other hand, if male and female productivity levels converge between 1980 and 2001, as males work fewer hours and females work somewhat longer hours, a somewhat greater physician supply is required in 1991 but a somewhat reduced supply is required in 2001. If productivity converges the overall efficiency factor actually increases from 0.968 in 1980 to 1.00 in 2001. Both sets of assumptions about future female productivity, namely (1) that relative female productivity is constant and (2) that male and female productivity converge, are used in giving alternative estimates of the future physician requirements.

HOURS WORKED ADJUSTMENT FACTOR. The physician working parties organized by the Requirements Committee also developed consensual estimates for the optimal physician workload within each specialty. Using these estimates we can calculate in Table 12 that the optimum average workload for the kinds of physicians billing OHIP is 2,243 hours per year. This optimal workload is 12.6 percent lower than the actual average workload as calculated from the OMA survey data in Table 9. Although we are concerned about the potential for overreporting of hours-worked in the OMA survey, it is not unreasonable to expect that physicians will reduce hours-worked to that extent by the year 2001. This, of course, implies a much greater physician requirement in the future than if hours-worked remained constant. In projecting the future physician requirement we assume that the entire difference between actual and optimum is eliminated by 2001 but that only half of it is eliminated by 1991.

### 2. *Results.*

These adjustment factors are now used in Exhibit 3 to project or estimate the future physician requirements under the two alternative assumptions about future female productivity. If female physicians continue to work 75 percent as many hours as male physicians we project that 13,439 full-time equivalent physicians will be required in 1991 to provide OHIP-paid services and that 15,529 physicians will be required by 2001. On the other hand, if male and female productivity converge, we project that 13,081 FTE physicians will be required in 1991 and that 14,565 physicians will be required in 2001.

We now compare these requirement estimates with the $\text{FTE}_{\text{OHIP}}$ supply projections developed in Section III. The "base" model projects that the $\text{FTE}_{\text{OHIP}}$ physician supply in 2001 will be 13,693. This is substantially less than the estimated requirements. In particular, if female physicians continue to be less productive than male physicians, we calculate that it is 12 percent less than the requirement; and if male and female productivity converge, we find that it is 6 percent less than the requirement. Recall that the so-called base model was developed as a straightforward extrapolation of recent experience.

Consider now several alternative supply modeling scenarios developed in Section III. Using the immigration assumptions adopted by the Task Force in its Phase I report, we project in Section III that the $\text{FTE}_{\text{OHIP}}$ supply in 2001 will be 14,867. This is virtually the same as the requirement estimated under the assumption that male and female productivty converge. However, it is still four percent less than the requirement estimated under the assumption that female physicians continue working three-quarters as many hours as male physicians.

Under one of the more extreme supply scenarios, namely assuming that the rate of immigraion is constant—we project that the $\text{FTE}_{\text{OHIP}}$ physician supply in 2001 will be 16,730. Under either assumption about male-female productivity, this is considerably more than the stimated requirement. However, as noted in Section III, we do not regard this scenario as eing plausible.

n conclusion, it appears that the Task Force should be more concerned about the potential or a future physician shortage than about the potential for a physician surplus. Although the hysician supply will clearly be much greater in the future, our analysis suggests that physiian requirements will also increase sharply. Because of population aging and a reasonable xpectation that physicians will choose to reduce the number of hours worked, the physician equirement will increase at a much faster rate than the population itself.

## C. Assumptions, Potential Biases and Caveats

ur requirements methodology entails two implicit assumptions that remain to be substaniated. By virture of not having made additional adjustments to the 1980 requirement we are mplicitly assuming that the age-specific utilization rates are not changing over time and that hysician productivity in terms of the volume of services provided per hour worked is not hanging over time. The calculations that led us to make these assumptions are presented elow.

*Assumption One: Age-Specific Utilization is Constant.*

We calculate that the "real" age-adjusted per capita cost of OHIP-paid health care services in 1980 was virtually the same as it was in 1975. The actual average per capita cost in 1975 was $104.33. After adjusting the 1980 per capita cost of $131.09 for population aging and physician fee inflation, as shown below, we determine that the 1975 equivalent is $105.48:

| *Actual 1980 Per Capita Cost*[13] | | *Age-Adjustment Factor* | | *Inflation-Adjustment Factor* | | *1975 Equivalent Per Capita Cost* |
|---|---|---|---|---|---|---|
| $131.09 | * | (128.30/131.09) | * | (116.0/141.1) | = | $105.48 |

Our age-adustment factor implies that the implicit rate of utilization increase due to aging over the 1975–1980 interval was 1.3 percent per year. This is broadly consistent with the 1982 Weiler Report. Weiler found that between 1973–1974 and 1981–1982 per capita utilization increased at an average annual rate of 1.4 percent per year.

*Assumption Two: Physician Productivity is Constant.*

Weiler found that after adjusting for inflation the average amount billed per physician was increasing at the rate of 1.9 percent per year. Our results do not support that finding. In 1976 the actual average OHIP billing amount per FTE physician (as defined in Section II) was $86,340, and in 1980 it was $104,989. After adjusting the 1980 amount for physician fee inflation, as shown below, we find that the 1976 equivalent is nearly the same, equal to $86,313.

| *Billings Per FTE Physician in 1980* | | *Inflation-Adjustment Factor* | | *1976 Equivalent* |
|---|---|---|---|---|
| $104,989 | * | (116.0/141.1) | = | $86,313 |

This calculation suggests that the "real" quantity of services provided per physician has not changed over the 1976–1980 interval.

We believe that the inconsistency between our findings and that of Weiler can be attributed to differences in the definition or measurement of "full-time equivalent" physicians. Weiler essentially considers that only 70 percent of the physicians billing OHIP in each year are working full time. He computes and compares the billing amounts per physician for those above the 30th percentile in revenue. Inasmuch as our analysis suggests not only that some of those over the 30th percentile are working part time but also that the proportion working full time has increased over the past decade, we are not surprised that Weiler's calculation shows an apparent increase in real output per physician. The result appears to be an artifact of Weiler's having used a less precise measure of the full-time equivalent supply.

The forecasting of physician manpower requirements is a substantially speculative exercise and involves a great variety of assumptions, all of which we have sought to make explicit. Furthermore, the apparent precision of the results reported can be deceptive. Whereas there is no meaningful mechanism for attaching confidence levels or ranges to the projections, the reader should understand that the results are most reasonably viewed as being "ballpark" estimates and that five or even ten percent variances are possible.

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[13] Includes laboratory services; cost information was not available on any other basis prior to 1978.

In refining the requirement estimates presented in this report the Task Force should take a variety of less tangible and less easily measured criteria into account. In particular, that Task Force must answer, at least qualitatively, the following questions:

1. Are there unmet *needs* for health care services? Will or can these needs be met by the year 2001?

2. Is over-utilization a significant problem? To what extent will utilization be controlled by the year 2001?

3. What impact will biomedical research and emerging technology have on the requirement for physician-provided services over the next 20 years?

4. Will physician extenders be used to substitute importantly for physicians by the year 2001?

5. What are the prospects for significant institutional reform of the health care system (e.g., widespread adoption of prepayment alternatives) during the next two decades?

We have not addressed these issues.

The Task Force should also weigh the potential for various biases in the data that we have used to project requirements. We have already expressed concern about the potential for over-reporting of time actually worked by physicians. We are also concerned that the physician working parties of the Requirements Committee were unduly generous in estimating the service times for workload analysis. The first of these could mean that the current physician requirement is understated and the latter could mean that it is overstated. In addition, an upward bias in hours worked would cause the required rate of growth in physician supply to be overstated. It is also important to underscore that the service time estimates were developed seven years ago and that practice patterns may have changed in some degree over the intervening years time interval. Also, the Task Force should consider whether or not physicians are actually likely to reduce hours worked to the "optimal" level during the next 20 years.

# V. Using the Michigan Model to Estimate the Physician Requirements

In estimating the number of physicians required to serve its population, the State of Michigan emphasizes a methodology which basically assumes that prepaid group practice patterns can be generalized to the entire population.[14] It perceives that prepaid group practices or HMOs "... .excel in terms of cost and accessibility and are at least equal with respect to quality and acceptability."

In this section we adapt the Michigan approach to the situation in Ontario and basically estimate the physician requirements implied by assuming HMO utilization and productivity levels. This is only one of the several "benchmarks" being developed in order to assist the Task Force in assessing the adequacy of physician supply in the Province. In general, we believe that the utilization-based requirement estimates developed in Section III are more useful. It is doubtful that one could achieve HMO efficiency standards within the existing delivery system. Major institutional reforms would be required.

In Table 13 we use the "Michigan model" to calculate the number of physicians required in Ontario for 1981. The estimate is developed as follows. The population of Ontario is divided into four community size groups—(1) communities with a population of 50,000 or more, (2) those with a population of 20,000 to 50,000 (3) those with a population of less than 20,000, and (4) those areas designated as being underserviced by the Ministry of Health. A different physician-population ratio based on HMO staffing patterns in the United States is then assumed for each of these groups. For the "large" and "medium" size communities we use the staffing ratios of large and medium-size HMOs as reported in the Michigan report. However, as also noted in Table 13, the Michigan study discounted staffing differences found in medium-size HMOs. We found no good rationale for doing so and have used the unadjusted staffing ratio. Also, the Michigan study applied staffing ratios from medium-size HMOs to small communities. We thought this to be inappropriate and attempted to find a more appropriate staffing ratio, one pertaining to small HMOs. However, we were not successful and have somewhat arbitrarily assumed that the ratio is 12 percent greater than that for medium-size HMOs, just as the ratio for medium-size HMOs is 12 percent greater than that for large ones. Finally, the actual average physician-population ratio of the underserviced areas is used for that population.[15] We reason that HMO efficiencies probably could not be achieved in such areas.

Simple application of HMO staffing ratios would suggest that the physician requirement is 9,525. However, the age distribution of the population in Ontario is somewhat older than that in the typical HMO. An age-adjustment factor is consequently required to take account of the greater medical needs of the elderly. This adjustment factor is developed in Table 14 using the same formula as that used in the Michjgan study. An adjustment is also required for out-of-plan utilization. We simply use the adjustment factor indicated on the basis of Michigan's review of literature. The age and out-of-plan adjustments combine to increase the physician requirement to 10,938. We then add the actual physician staffing of various health care institutions (e.g., psychiatric hospitals) that would not be supplanted by an HMO delivery system. We thus find that a total of 11,215 physicians would still be required if HMO practice patterns were adopted. This is about 21 percent less than the full-time equivalent number of physicians engaged in patient care as calculated in Table 3. This finding further substantiates that Ontario physicians are operating at a reasonably high level of efficiency. Given the vagaries of extrapolating HMO practice patterns to the general population (see below), it is reassuring to find that the difference between the physician supply and physician requirement is only 20 percent under rather extreme assumptions. However, even this comparison overstates the case. HMOs use physician extenders and other ancillary personnel much more intensively. Thus, any savings achieved by reducing the physician supply would be at least partly offset by costs associated with increasing the supply of ancillary personnel.

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[14] *Planning for Physician Requirements and Supply in Michigan*, State of Michigan, May 1981.

[15] The ratio of 230 per 100,000 population was calculated from data provided by the Ministry of Health.

Our HMO-based physician requirement estimate is extrapolated to the future as follows. The 11,215 estimate for 1981 is simply adjusted for the projected increase in population and the continued aging of the population. Age-adjustment factors for 1991 and 2001 are also developed in Table 14. The physician requirements for 1991 and 2001 are then calculated as shown below:

| | *1981 Base* | | *Population Adjustment* | | *Age Adjustment* | | |
|---|---|---|---|---|---|---|---|
| **1991** | 11,215 | * | (9,230,625 / 8,625,100) | * | (1.082 / 1.044) | = | **12,432** |
| **2001** | 11,215 | * | (9,532,935 / 8,625,100) | * | (1.109 / 1.044) | = | **13,161** |

The 1991 estimate is about 11 percent greater than that for 1981, and the 2001 estimate is about 17 percent greater. Unfortunately, these estimates are not directly comparable with either the C.P.S.O. or the $FTE_{OHIP}$ supply projections. However, if one assumes that the ratio of FTE physicians engaged in patient care (see Table 3) to C.P.S.O. physicians is constant, we calculate from the "base" model that physician supply in 2001 will exceed the requirement by almost 25 percent.

We indicate one additional very important caveat with respect to the interpretation of these results. We have only controlled for age difference between HMOs and the general population. To the extent that HMO members are otherwise different from the general population the HMO utilization assumptions underlying this approach may be inappropriate. It is frequently said that self-selection biases cause HMOs to have healthier members than the population at large. If this is true, the physician requirement is understated. Unfortunately, there is no research consensus on this point.

# VI. Summary

The key study findings are as follows:

- In 1981 Ontario had roughly 14,000 physicians working full-time (or rather on a full-time equivalent basis) in patient care, one physician for each 610 persons. The total number of full-time equivalent physicians providing OHIP-paid services was approximately 11,000 or one for each 783 persons.

- Historical data are used to estimate a statistical model of factors affecting the physician supply in Ontario. The estimated relationships are used to simulate or project the future physician supply for each individual year to the year 2001. The results indicate that the aggregate population-to-physician ratio will continue falling, albeit very slowly, and nearly stabilize by the end of the century. On the other hand, the more relevant population-to-OHIP physician ratio is projected to fall by about ten percent between 1981 and 2001. Although several alternative scenarios indicate larger physician supplies in the future, we judge them to be less plausible.

- The actual physician supply in 1980 appears to have been appropriate given the level and kind of services provided.

- Even under the most extreme assumptions, namely that HMO efficiency standards are applied to the entire health care delivery system, it is reassuring to find that the difference between the physician supply and the physician requirement is only 20 percent. That is, physicians in Ontario appear to be operating at a comparatively high level of efficiency.

- Between 14,565 and 15,529 full-time equivalent physicians will be required in 2001 to provide OHIP-paid services, about 32 to 41 percent more than the number of full-time equivalent OHIP physicians in 1981.

- In comparing the estimated future physician requirements with the physician supply projections, we indicate greater concern about the potential for a physician shortage in the future than we do for a physician surplus. Although the physician supply will clearly be much greater in the future, our analysis suggests that physician requirements will also increase sharply. Because of population aging and a reasonable expectation that physicians will choose to reduce the number of hours worked, the physician requirements will increase at a much faster rate than the population. This implies that a reduction in the population-to-physician ratio is appropriate and needed.

The forecasting of physician manpower requirements and supply is a substantially speculative exercise and involves a great variety of assumptions, all of which we have sought to make explicit. Furthermore, the apparent precision of the results reported can be deceptive. Whereas there is no meaningful mechanism for attaching confidence levels or ranges to the projections, the reader should understand that the results are most reasonably viewed as being "ballpark" estimates and that five or even ten percent variances are possible. Furthermore, in refining the requirement estimates presented in this report a variety of less tangible and less easily measured criteria should be taken into account.

## TABLE 1

| Physician Payment Threshold By Year<br>Used to Calculate FTEs/Year | |
|---|---|
| 1981-82 | $80,000 |
| 1980-81 | 69,700 |
| 1979-80 | 64,300 |
| 1978-79 | 59,600 |
| 1977-78 | 55,200 |
| 1976-77 | 51,800 |
| 1975-76 | 47,900 |
| 1974-75 | 46,100 |
| 1973-74 | 42,900 |
| 1972-73 | 42,900 |

*Source:* Physician fee index calculated from the 1982 Weiler report.

## TABLE 2

### FTE Physicians Per Year Providing OHIP Services

| Year | FTE Billing OHIP | Interns and Residents (Intres) | Total FTE (FTE + 0.35 Intres) |
|---|---|---|---|
| 1972–73 | 7558 | 2304 | 8364 |
| 1973–74 | 8042 | 2215 | 8817 |
| 1974–75 | 8532 | 2202 | 9303 |
| 1975–76 | 8949 | 2643 | 9874 |
| 1976–77 | 9162 | 2450 | 10019 |
| 1977–78 | 9393 | 2616 | 10309 |
| 1978–79 | 9594 | 2864 | 10596 |
| 1979–80 | 9749 | 2838 | 10742 |
| 1980–81 | 9992 | 2926 | 11016 |

*Sources:*

*FTE Billing OHIP:*
Calculated from data available through the OHIP Statistical Reporting System.

*Interns and Residents:*
Statistics provided by Provinces to the Health Information Division, Policy, Planning and Information Branch, Department of National Health and Welfare.

## TABLE 3

**Total FTE Physicians**
**Providing Patient Care Services**
**FY 1981**

| **Category** | **Number of Physicians** |
|---|---|
| FTE Physicians Billing OHIP | 9,992 |
| Psychiatric | 172 |
| HSO | 116 |
| Alternate Payment | |
| — Part-time (217 x .5) | 108 |
| Children's Facility | 9 |
| Mental Retardation | 41 |
| Public Health | 55 |
| Public Hospitals | |
| — Full-time | 1,524 |
| — Part-time (2033 x .5) | 1,016 |
| Federal Hospitals | |
| — Full-time | 55 |
| — Part-time (60 x .5) | 30 |
| Interns and Residents (2926 x .35) | 1,024 |
| | 14,142 |

*Source:*
Physician numbers other than OHIP from Data Development and Evaluation Branch, Ontario Ministry of Health. See text for discussion of FTE conversion factors.

# TABLE 4

## Actual Parameter Values, 1972–1980, and Parameter Forecasts, 1981–2001

| Year | Ratio of Full-Time Equivalent Physicians Billing OHIP to CPSO Registered Physicians (FTE/CPSO) | Ratio of Ontario Graduates to Population (GRADS/POP) | Proportion of Ontario Graduates Registering (LIC/GRADS) | Non-Ontario Graduates Registering as a Proportion of Total CPSO Registration (IMMIG/CPSO) | Subtractions as a Proportion of Total CPSO Registration ((ATTRIT-RELIC)/CPSO) | Ratio of Special Register to Regular Register (SPECIAL/GENERAL) |
|---|---|---|---|---|---|---|
| 1971 | NA | .04981 | .8837 | .05385 | .01580 | .07233 |
| 1972 | NA | .05235 | .8714 | .05456 | .02543 | .06157 |
| 1973 | .6516 | .05865 | .7804 | .03295 | .02197 | .05778 |
| 1974 | .6609 | .06581 | .6906 | .03126 | .01851 | .05601 |
| 1975 | .6700 | .06730 | .6181 | .02622 | .01095 | .06026 |
| 1976 | .6799 | .06933 | .6841 | .02355 | .02265 | .03707 |
| 1977 | .6842 | .06786 | .6314 | .02247 | .02424 | .03262 |
| 1978 | .6906 | .07094 | .6461 | .01836 | .03289 | .03055 |
| 1979 | .7027 | .07243 | .5601 | .01937 | .02467 | .02774 |
| 1980 | .7018 | .06947 | .7429 | .01888 | .02345 | .02617 |
| 1981 | .7033* | .07026* | .7937* | .01688 | .02740 | .02680 |
| 1986 | .7232 | .0718 | .5818 | .01220 | .02740 | .01890 |
| 1991 | .7354 | .0708 | .5521 | .01236 | .02740 | .01316 |
| 1996 | .7450 | .0691 | .5289 | .01183 | .02740 | .00865 |
| 2001 | .7528 | .0668 | .5097 | .01130 | .02740 | .00494 |

*Actual value, not an estimate.

NA — Not Available.

# TABLE 5

## Actual Physician Supply, 1972–1980 and Projection of Physician Supply to the Year 2001

| | Beginning of Year | | | Additions | | | End of Year | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Number of Physicians on General Registry | Full-Time Equivalent Number of Physicians Billing OHIP | Number of Graduates | Number of Ontario Graduates Registered | Number of Non-Ontario Graduates Registered | Subtractions (Deaths, Retirement, and Net Emigration)1 | Number of Physicians on Regular Registry | Number of Physicians on Special Registry | Total Physicians on CPSO Registry | Full-time Equivalent Number of Physicians Billing OHIP | Population/CPSO Ratio | Population/FTE Ratio |
| 1972 | 11,418 | — | 412 | 359 | 665 | 310 | 12,133 | 703 | 12,836 | 8,364 | 609.3 | 935.1 |
| 1973 | 12,133 | 8,364 | 469 | 386 | 423 | 282 | 12,641 | 701 | 13,341 | 8,817 | 594.1 | 899.0 |
| 1974 | 12,641 | 8,817 | 530 | 366 | 417 | 247 | 13,177 | 708 | 13,885 | 9,303 | 580.0 | 865.8 |
| 1975 | 13,177 | 9,303 | 550 | 340 | 364 | 152 | 13,729 | 794 | 14,523 | 9,874 | 562.7 | 827.6 |
| 1976 | 13,729 | 9,874 | 573 | 392 | 342 | 329 | 14,134 | 509 | 14,643 | 10,019 | 564.4 | 824.9 |
| 1977 | 14,134 | 10,019 | 567 | 358 | 329 | 355 | 14,466 | 461 | 14,927 | 10,309 | 559.7 | 810.5 |
| 1978 | 14,466 | 10,309 | 599 | 387 | 274 | 491 | 14,636 | 442 | 15,078 | 10,596 | 560.8 | 796.9 |
| 1979 | 14,636 | 10,596 | 616 | 345 | 292 | 372 | 14,901 | 406 | 15,307 | 10,742 | 555.6 | 791.7 |
| 1980 | 14,901 | 10,742 | 595 | 442 | 389 | 359 | 15,273 | 390 | 15,663 | 11,016 | 546.6 | 777.4 |
| 1981 | 15,273 | 11,016 | 615 | 472 | 258 | 429 | 15,575 | 417 | 15,992 | 11,297 | 539.3 | 763.5 |
| 1982 | 15,575 | 11,297 | 622 | 478 | 212 | 438 | 15,826 | 395 | 16,221 | 11,522 | 353.8 | 754.3 |
| 1983 | 15,826 | 11,522 | 628 | 482 | 171 | 444 | 16,035 | 373 | 16,409 | 11,714 | 533.7 | 747.6 |
| 1984 | 16,035 | 11,714 | 634 | 487 | 150 | 450 | 16,223 | 352 | 16,575 | 11,888 | 532.3 | 742.2 |
| 1985 | 16,223 | 11,888 | 639 | 490 | 138 | 454 | 16,397 | 332 | 16,729 | 12,051 | 531.3 | 737.6 |
| 1986 | 16,197 | 12,051 | 643 | 494 | 130 | 458 | 16,562 | 313 | 16,875 | 12,204 | 530.7 | 733.8 |
| 1987 | 16,562 | 12,204 | 646 | 496 | 124 | 462 | 16,720 | 295 | 17,015 | 12,351 | 529.5 | 729.5 |
| 1988 | 16,720 | 12,351 | 648 | 498 | 116 | 466 | 16,868 | 277 | 17,145 | 12,490 | 528.7 | 725.8 |
| 1989 | 16,868 | 12,490 | 651 | 500 | 109 | 470 | 17,007 | 260 | 17,266 | 12,620 | 528.2 | 722.7 |
| 1990 | 17,007 | 12,620 | 652 | 501 | 104 | 473 | 17,138 | 243 | 17,382 | 12,744 | 527.9 | 720.0 |
| 1991 | 17,138 | 12,744 | 654 | 502 | 101 | 476 | 17,265 | 227 | 17,492 | 12,864 | 527.7 | 717.6 |
| 1992 | 17,265 | 12,864 | 654 | 502 | 99 | 479 | 17,387 | 212 | 17,598 | 12,978 | 526.7 | 714.2 |
| 1993 | 17,387 | 12,978 | 653 | 502 | 91 | 482 | 17,497 | 197 | 17,694 | 13,084 | 526.0 | 711.4 |
| 1994 | 17,497 | 13,084 | 653 | 501 | 84 | 485 | 17,598 | 182 | 17,780 | 13,182 | 525.6 | 709.0 |
| 1995 | 17,598 | 13,182 | 652 | 501 | 79 | 487 | 17,691 | 168 | 17,859 | 13,273 | 525.5 | 707.1 |
| 1996 | 17,691 | 13,272 | 651 | 500 | 77 | 489 | 17,778 | 154 | 17,932 | 13,359 | 525.5 | 705.4 |
| 1997 | 17,778 | 13,359 | 648 | 498 | 76 | 491 | 17,861 | 140 | 18,001 | 13,441 | 524.7 | 702.7 |
| 1998 | 17,861 | 13,441 | 646 | 496 | 69 | 493 | 17,933 | 127 | 18,060 | 13,514 | 524.2 | 700.5 |
| 1999 | 17,933 | 13,514 | 643 | 494 | 63 | 495 | 17,995 | 114 | 18,109 | 13,579 | 524.0 | 698.8 |
| 2000 | 17,995 | 13,579 | 640 | 491 | 60 | 496 | 18,050 | 102 | 18,152 | 13,639 | 524.0 | 697.3 |
| 2001 | 18,050 | 13,639 | 636 | 488 | 58 | 497 | 18,100 | 89 | 18,189 | 13,693 | 523.6 | 695.5 |

## TABLE 6

### Projection of Physician Supply to the Year 2001
### — Uses the Estimated LIC/GRADS Relationship

| | Beginning of Year | | | Additions | | Subtractions | | | End of Year | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | General | FTE | Grads | Lic | Immig | | General | Special | CPSO | FTE | POP/CPSO | POP/FTE |
| 1981 | 15273 | 11016 | 615 | 383 | 258 | 429 | 15485 | 415 | 15900 | 11232 | 542.5 | 767.9 |
| 1982 | 15485 | 11232 | 622 | 381 | 212 | 436 | 15643 | 391 | 16033 | 11389 | 542.1 | 763.1 |
| 1983 | 15643 | 11389 | 628 | 380 | 190 | 439 | 15773 | 367 | 16140 | 11523 | 542.6 | 760.0 |
| 1984 | 15773 | 11523 | 634 | 379 | 189 | 442 | 15898 | 345 | 16243 | 11650 | 543.2 | 757.3 |
| 1985 | 15898 | 11650 | 639 | 376 | 193 | 445 | 16022 | 325 | 16347 | 11775 | 543.8 | 754.9 |
| 1986 | 16022 | 11775 | 643 | 374 | 198 | 448 | 16146 | 305 | 16451 | 11898 | 544.3 | 752.7 |
| 1987 | 16146 | 11898 | 646 | 371 | 203 | 451 | 16270 | 287 | 16557 | 12019 | 544.2 | 749.7 |
| 1988 | 16270 | 12019 | 648 | 369 | 204 | 454 | 16389 | 269 | 16658 | 12135 | 544.2 | 747.0 |
| 1989 | 16389 | 12135 | 651 | 366 | 204 | 456 | 16503 | 252 | 16755 | 12246 | 544.4 | 744.8 |
| 1990 | 16503 | 12246 | 652 | 364 | 205 | 459 | 16612 | 236 | 16848 | 12353 | 544.6 | 742.8 |
| 1991 | 16612 | 12353 | 654 | 361 | 207 | 462 | 16719 | 220 | 16939 | 12457 | 544.9 | 741.0 |
| 1992 | 16719 | 12457 | 654 | 358 | 210 | 464 | 16822 | 205 | 17027 | 12557 | 544.4 | 738.2 |
| 1993 | 16822 | 12557 | 653 | 354 | 206 | 467 | 16916 | 190 | 17106 | 12650 | 544.1 | 733.8 |
| 1994 | 16916 | 12650 | 653 | 351 | 204 | 469 | 17002 | 176 | 17178 | 12735 | 544.1 | 733.9 |
| 1995 | 17002 | 12735 | 652 | 348 | 203 | 471 | 17082 | 162 | 17244 | 12816 | 544.2 | 732.3 |
| 1996 | 17082 | 12816 | 651 | 344 | 203 | 472 | 17157 | 148 | 17305 | 12892 | 544.5 | 730.9 |
| 1997 | 17157 | 12892 | 648 | 340 | 205 | 474 | 17228 | 135 | 17363 | 12964 | 544.0 | 728.5 |
| 1998 | 17228 | 12964 | 646 | 336 | 201 | 476 | 17289 | 123 | 17412 | 13029 | 543.7 | 726.6 |
| 1999 | 17289 | 13029 | 643 | 332 | 198 | 477 | 17343 | 110 | 17453 | 13087 | 543.7 | 725.1 |
| 2000 | 17343 | 13087 | 640 | 328 | 197 | 478 | 17390 | 98 | 17488 | 13140 | 543.9 | 723.8 |
| 2001 | 17390 | 13140 | 636 | 324 | 197 | 479 | 17432 | 86 | 17518 | 13188 | 543.7 | 722.1 |

## TABLE 7 (a)

### Projection of Physician Supply to the Year 2001
### — Assumes That Grads is Constant at 606

| | Beginning of Year | | | Additions | | Subtractions | | | End of Year | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | General | FTE | Grads | Lic | Immig | | General | Special | CPSO | FTE | POP/CPSO | POP/FTE |
| 1981 | 15273 | 11016 | 606 | 465 | 258 | 429 | 15568 | 417 | 15985 | 11292 | 539.6 | 763.8 |
| 1982 | 15568 | 11292 | 606 | 465 | 212 | 438 | 15807 | 395 | 16202 | 11508 | 536.4 | 755.2 |
| 1983 | 15807 | 11508 | 606 | 465 | 173 | 444 | 16001 | 373 | 16374 | 11689 | 534.8 | 749.2 |
| 1984 | 16001 | 11689 | 606 | 465 | 155 | 449 | 16173 | 351 | 16524 | 11851 | 534.0 | 744.5 |
| 1985 | 16173 | 11851 | 606 | 465 | 145 | 453 | 16330 | 331 | 16661 | 12001 | 533.5 | 740.7 |
| 1986 | 16330 | 12001 | 606 | 465 | 141 | 457 | 16480 | 311 | 16791 | 12144 | 533.3 | 737.4 |
| 1987 | 16480 | 12144 | 606 | 465 | 139 | 460 | 16624 | 293 | 16917 | 12280 | 532.6 | 733.7 |
| 1988 | 16624 | 12280 | 606 | 465 | 134 | 464 | 16759 | 275 | 17034 | 12409 | 532.2 | 730.5 |
| 1989 | 16759 | 12409 | 606 | 465 | 130 | 467 | 16888 | 258 | 17146 | 12532 | 531.9 | 727.8 |
| 1990 | 16888 | 12532 | 606 | 465 | 127 | 470 | 17011 | 241 | 17252 | 12649 | 531.9 | 725.4 |
| 1991 | 17011 | 12649 | 606 | 465 | 126 | 473 | 17130 | 225 | 17355 | 12763 | 531.9 | 723.2 |
| 1992 | 17130 | 12763 | 606 | 465 | 126 | 476 | 17246 | 210 | 17456 | 12873 | 531.0 | 720.0 |
| 1993 | 17246 | 12873 | 606 | 465 | 120 | 478 | 17353 | 195 | 17548 | 12977 | 530.4 | 717.3 |
| 1994 | 17353 | 12977 | 606 | 465 | 115 | 481 | 17453 | 181 | 17633 | 13073 | 530.0 | 714.9 |
| 1995 | 17453 | 13073 | 606 | 465 | 111 | 483 | 17546 | 166 | 17712 | 13164 | 529.8 | 712.9 |
| 1996 | 17546 | 13164 | 606 | 465 | 109 | 485 | 17634 | 153 | 17787 | 13251 | 529.8 | 711.1 |
| 1997 | 17634 | 13251 | 606 | 465 | 108 | 487 | 17720 | 139 | 17859 | 13335 | 528.8 | 708.3 |
| 1998 | 17720 | 13335 | 606 | 465 | 101 | 489 | 17797 | 126 | 17923 | 13411 | 528.2 | 705.9 |
| 1999 | 17797 | 13411 | 606 | 465 | 94 | 491 | 17865 | 113 | 17979 | 13481 | 527.8 | 703.8 |
| 2000 | 17865 | 13481 | 606 | 465 | 90 | 493 | 17928 | 101 | 18029 | 13546 | 527.5 | 702.1 |
| 2001 | 17928 | 13546 | 606 | 465 | 87 | 494 | 17986 | 89 | 18075 | 13608 | 526.9 | 699.9 |

# TABLE 7 (b)

## Projection of Physician Supply to the Year 2001
## — Assumes a 15 Percent Reduction in Grads

| | Beginning of Year | | | Additions | | Subtractions | End of Year | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | General | FTE | Grads | Lic | Immig | | General | Special | CPSO | FTE | POP/CPSO | POP/FTE |
| 1981 | 15273 | 11016 | 515 | 396 | 258 | 429 | 15498 | 415 | 15913 | 11241 | 542.0 | 767.3 |
| 1982 | 15408 | 11241 | 515 | 396 | 212 | 436 | 15669 | 391 | 16060 | 11408 | 541.2 | 761.8 |
| 1983 | 15669 | 11408 | 515 | 396 | 187 | 440 | 15812 | 368 | 16180 | 11551 | 541.2 | 758.1 |
| 1984 | 15812 | 11551 | 515 | 396 | 183 | 443 | 15948 | 346 | 16294 | 11687 | 541.5 | 755.0 |
| 1985 | 15948 | 11687 | 515 | 396 | 185 | 446 | 16082 | 326 | 16408 | 11819 | 541.8 | 752.1 |
| 1986 | 16082 | 11819 | 515 | 396 | 188 | 450 | 16216 | 306 | 16522 | 11949 | 542.0 | 749.4 |
| 1987 | 16216 | 11949 | 515 | 396 | 191 | 453 | 16349 | 288 | 16637 | 12078 | 541.6 | 746.0 |
| 1988 | 16349 | 12078 | 515 | 396 | 189 | 456 | 16478 | 270 | 16749 | 12201 | 541.2 | 743.0 |
| 1989 | 16478 | 12201 | 515 | 396 | 188 | 459 | 16602 | 254 | 16856 | 12320 | 541.1 | 740.3 |
| 1990 | 16602 | 12320 | 515 | 396 | 187 | 462 | 16723 | 237 | 16960 | 12435 | 541.0 | 737.9 |
| 1991 | 16723 | 12435 | 515 | 396 | 187 | 465 | 16840 | 222 | 17062 | 12547 | 541.0 | 735.7 |
| 1992 | 16840 | 12547 | 515 | 396 | 187 | 467 | 16955 | 206 | 17161 | 12656 | 540.1 | 732.4 |
| 1993 | 16955 | 12656 | 515 | 396 | 181 | 470 | 17062 | 192 | 17254 | 12758 | 539.5 | 729.5 |
| 1994 | 17062 | 12758 | 515 | 396 | 176 | 473 | 17161 | 177 | 17338 | 12854 | 539.0 | 727.1 |
| 1995 | 17161 | 12854 | 515 | 396 | 173 | 475 | 17254 | 164 | 17417 | 12945 | 538.8 | 725.0 |
| 1996 | 17254 | 12945 | 515 | 396 | 171 | 477 | 17343 | 150 | 17493 | 13031 | 538.7 | 723.1 |
| 1997 | 17343 | 13031 | 515 | 396 | 170 | 479 | 17428 | 137 | 17565 | 13115 | 537.7 | 720.1 |
| 1998 | 17428 | 13115 | 515 | 396 | 163 | 481 | 17505 | 124 | 17630 | 13192 | 537.0 | 717.6 |
| 1999 | 17505 | 13192 | 515 | 396 | 157 | 483 | 17574 | 112 | 17686 | 13262 | 536.5 | 715.5 |
| 2000 | 17574 | 13262 | 515 | 396 | 152 | 485 | 17637 | 99 | 17737 | 13327 | 536.2 | 713.7 |
| 2001 | 17637 | 13327 | 515 | 396 | 149 | 486 | 17696 | 87 | 17783 | 13368 | 535.5 | 711.4 |

## TABLE 7 (c)

### Projection of Physician Supply to the Year 2001
### — Assumes 15 Percent Increase in Grads

| | Beginning of Year | | | Additions | | Subtractions | | | End of Year | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | General | FTE | Grads | Lic | Immig | | General | Special | CPSO | FTE | POP/CPSO | POP/FTE |
| 1981 | 15273 | 11016 | 697 | 535 | 258 | 429 | 15637 | 419 | 16057 | 11343 | 537.2 | 760.4 |
| 1982 | 15637 | 11343 | 697 | 535 | 212 | 440 | 15945 | 398 | 16343 | 11609 | 531.8 | 748.7 |
| 1983 | 15945 | 11609 | 697 | 535 | 158 | 448 | 16190 | 377 | 16567 | 11828 | 528.6 | 740.4 |
| 1984 | 16190 | 11828 | 697 | 535 | 125 | 454 | 16397 | 356 | 16753 | 12016 | 526.7 | 734.3 |
| 1985 | 16397 | 12016 | 697 | 535 | 104 | 459 | 16577 | 336 | 16913 | 12183 | 525.6 | 729.6 |
| 1986 | 16577 | 12183 | 697 | 535 | 92 | 463 | 16741 | 316 | 17058 | 12336 | 525.0 | 725.9 |
| 1987 | 16741 | 12336 | 697 | 535 | 65 | 467 | 16894 | 298 | 17192 | 12480 | 524.1 | 722.0 |
| 1988 | 16894 | 12480 | 697 | 535 | 77 | 471 | 17035 | 280 | 17315 | 12614 | 523.6 | 718.7 |
| 1989 | 17035 | 12614 | 697 | 535 | 71 | 474 | 17167 | 262 | 17429 | 12739 | 523.3 | 715.9 |
| 1990 | 17167 | 12739 | 697 | 535 | 67 | 478 | 17292 | 245 | 17537 | 12858 | 523.2 | 713.6 |
| 1991 | 17292 | 12858 | 697 | 535 | 65 | 481 | 17412 | 229 | 17641 | 12973 | 523.2 | 711.5 |
| 1992 | 17412 | 12973 | 697 | 535 | 65 | 483 | 17529 | 213 | 17742 | 13085 | 522.4 | 708.4 |
| 1993 | 17529 | 13085 | 697 | 535 | 59 | 486 | 17637 | 198 | 17835 | 13188 | 521.9 | 705.7 |
| 1994 | 17637 | 13188 | 697 | 535 | 53 | 489 | 17736 | 183 | 17919 | 13285 | 521.6 | 703.5 |
| 1995 | 17736 | 13285 | 697 | 535 | 49 | 491 | 17829 | 169 | 17998 | 13376 | 521.4 | 701.6 |
| 1996 | 17829 | 13376 | 697 | 535 | 46 | 493 | 17917 | 155 | 18073 | 13463 | 521.4 | 699.9 |
| 1997 | 17917 | 13463 | 697 | 535 | 45 | 495 | 18003 | 141 | 18144 | 13548 | 520.5 | 697.2 |
| 1998 | 18003 | 13548 | 697 | 535 | 38 | 497 | 18079 | 128 | 18208 | 13624 | 519.9 | 694.8 |
| 1999 | 18079 | 13624 | 697 | 535 | 32 | 499 | 18148 | 115 | 18263 | 13695 | 519.6 | 692.9 |
| 2000 | 18148 | 13695 | 697 | 535 | 27 | 500 | 18210 | 103 | 18312 | 13759 | 519.4 | 691.2 |
| 2001 | 18210 | 13759 | 697 | 535 | 24 | 502 | 18268 | 90 | 18358 | 13821 | 518.8 | 689.1 |

## TABLE 7 (d)

### Projection of Physician Supply to the Year 2001
### — Assumes GRADS/POP is Constant at .0695

|  | Beginning of Year |  |  | Additions |  | Subtractions |  |  | End of Year |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | General | FTE | Grads | Lic | Immig |  | General | Special | CPSO | FTE | POP/CPSO | POP/FTE |
| 1981 | 15273 | 11016 | 599 | 460 | 258 | 429 | 15563 | 417 | 15980 | 11288 | 539.8 | 764.1 |
| 1982 | 15563 | 11288 | 604 | 464 | 212 | 438 | 15801 | 395 | 16195 | 11504 | 536.7 | 755.5 |
| 1983 | 15801 | 11504 | 609 | 467 | 174 | 444 | 15998 | 372 | 16371 | 11687 | 534.9 | 749.3 |
| 1984 | 15998 | 11687 | 613 | 471 | 156 | 449 | 16176 | 351 | 16528 | 11854 | 533.8 | 744.3 |
| 1985 | 16176 | 11854 | 618 | 474 | 146 | 453 | 16344 | 331 | 16675 | 12011 | 533.1 | 740.1 |
| 1986 | 16344 | 12011 | 622 | 478 | 140 | 457 | 16505 | 312 | 16817 | 12162 | 532.5 | 736.3 |
| 1987 | 16505 | 12162 | 626 | 481 | 136 | 461 | 16661 | 294 | 16954 | 12307 | 531.4 | 732.1 |
| 1988 | 16661 | 12307 | 630 | 484 | 128 | 465 | 16808 | 276 | 17084 | 12446 | 530.6 | 728.4 |
| 1989 | 16808 | 12446 | 634 | 487 | 122 | 468 | 16949 | 259 | 17207 | 12577 | 530.0 | 725.2 |
| 1990 | 16949 | 12577 | 638 | 490 | 117 | 471 | 17084 | 242 | 17326 | 12704 | 529.6 | 722.3 |
| 1991 | 17084 | 12704 | 642 | 493 | 113 | 475 | 17215 | 227 | 17442 | 12826 | 529.2 | 719.7 |
| 1992 | 17215 | 12826 | 644 | 495 | 111 | 478 | 17342 | 211 | 17554 | 12945 | 528.0 | 716.0 |
| 1993 | 17342 | 12945 | 647 | 497 | 102 | 481 | 17460 | 196 | 17656 | 13056 | 527.1 | 712.9 |
| 1994 | 17460 | 13056 | 650 | 499 | 94 | 484 | 17569 | 182 | 17751 | 13160 | 526.5 | 710.2 |
| 1995 | 17569 | 13160 | 652 | 501 | 88 | 486 | 17671 | 168 | 17839 | 13258 | 526.1 | 707.8 |
| 1996 | 17671 | 13258 | 655 | 503 | 83 | 489 | 17769 | 154 | 17922 | 13351 | 525.8 | 705.7 |
| 1997 | 17769 | 13351 | 656 | 504 | 80 | 491 | 17862 | 140 | 18002 | 13441 | 524.6 | 702.7 |
| 1998 | 17862 | 13441 | 658 | 505 | 71 | 493 | 17945 | 127 | 18073 | 13523 | 523.8 | 700.0 |
| 1999 | 17945 | 13523 | 659 | 506 | 63 | 495 | 18020 | 114 | 18134 | 13598 | 523.3 | 697.8 |
| 2000 | 18020 | 13598 | 661 | 508 | 57 | 497 | 18088 | 102 | 18190 | 13667 | 522.9 | 695.9 |
| 2001 | 18088 | 13667 | 662 | 508 | 53 | 498 | 18151 | 90 | 18240 | 13732 | 522.1 | 693.6 |

## TABLE 7 (e)

### Projection of Physician Supply to the Year 2001
### — Uses Phase I Immigration Assumptions

| | Beginning of Year | | | Additions | | Subtractions | | | End of Year | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | General | FTE | Grads | Lic | Immig | | General | Special | CPSO | FTE | POP/CPSO | POP/FTE |
| 1981 | 15273 | 11016 | 615 | 472 | 275 | 429 | 15591 | 418 | 16009 | 11309 | 538.8 | 762.7 |
| 1982 | 15591 | 11309 | 622 | 478 | 275 | 439 | 15905 | 397 | 16302 | 11580 | 533.1 | 750.5 |
| 1983 | 15905 | 11580 | 628 | 482 | 275 | 447 | 16216 | 378 | 16594 | 11846 | 527.7 | 739.2 |
| 1984 | 16216 | 11846 | 634 | 487 | 275 | 455 | 16523 | 359 | 16882 | 12108 | 522.6 | 728.7 |
| 1985 | 16523 | 12108 | 639 | 490 | 275 | 463 | 16826 | 341 | 17167 | 12366 | 517.8 | 718.8 |
| 1986 | 16826 | 12366 | 643 | 494 | 185 | 470 | 17034 | 322 | 17356 | 12552 | 516.0 | 713.4 |
| 1987 | 17034 | 12552 | 646 | 496 | 185 | 476 | 17240 | 304 | 17544 | 12735 | 513.6 | 707.5 |
| 1988 | 17240 | 12735 | 648 | 498 | 185 | 481 | 17442 | 286 | 17728 | 12915 | 511.3 | 701.9 |
| 1989 | 17442 | 12915 | 651 | 500 | 185 | 486 | 17641 | 269 | 17910 | 13091 | 509.2 | 696.7 |
| 1990 | 17641 | 13091 | 652 | 501 | 185 | 491 | 17836 | 253 | 18089 | 13263 | 507.2 | 691.8 |
| 1991 | 17836 | 13263 | 654 | 502 | 185 | 496 | 18028 | 237 | 18265 | 13432 | 505.4 | 687.2 |
| 1992 | 18028 | 13432 | 654 | 502 | 185 | 500 | 18214 | 222 | 18436 | 13596 | 502.8 | 681.7 |
| 1993 | 18214 | 13596 | 653 | 502 | 185 | 505 | 18396 | 207 | 18603 | 13756 | 500.3 | 676.6 |
| 1994 | 18396 | 13756 | 653 | 501 | 185 | 510 | 18573 | 192 | 18765 | 13912 | 498.1 | 671.8 |
| 1995 | 18573 | 13912 | 652 | 501 | 185 | 514 | 18744 | 178 | 18922 | 14063 | 496.0 | 667.3 |
| 1996 | 18744 | 14063 | 651 | 500 | 185 | 518 | 18911 | 164 | 19074 | 14210 | 494.0 | 663.1 |
| 1997 | 18911 | 14210 | 648 | 498 | 185 | 523 | 19071 | 150 | 19221 | 14351 | 491.4 | 658.1 |
| 1998 | 19071 | 14351 | 646 | 496 | 185 | 527 | 19225 | 136 | 19361 | 14488 | 489.0 | 653.4 |
| 1999 | 19225 | 14488 | 643 | 494 | 185 | 530 | 19373 | 123 | 19496 | 14619 | 486.7 | 649.1 |
| 2000 | 19373 | 14619 | 640 | 491 | 185 | 534 | 19515 | 110 | 19625 | 14746 | 484.6 | 645.0 |
| 2001 | 19515 | 14746 | 636 | 488 | 185 | 538 | 19651 | 97 | 19748 | 14867 | 482.3 | 640.6 |

## TABLE 7 (f)

### Projection of Physician Supply to the Year 2001
### — Assumes IMMIG/CPSO is Constant at .0188

| | Beginning of Year | | | Additions | | Subtractions | | | End of Year | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | General | FTE | Grads | Lic | Immig | | General | Special | CPSO | FTE | POP/CPSO | POP/FTE |
| 1981 | 15273 | 11016 | 615 | 472 | 288 | 429 | 15604 | 418 | 16022 | 11319 | 538.3 | 762.0 |
| 1982 | 15604 | 11319 | 622 | 478 | 294 | 439 | 15937 | 398 | 16335 | 11603 | 532.1 | 749.0 |
| 1983 | 15937 | 11603 | 628 | 482 | 301 | 448 | 16273 | 379 | 16652 | 11888 | 525.9 | 736.6 |
| 1984 | 16273 | 11888 | 634 | 487 | 307 | 456 | 16611 | 361 | 16972 | 12173 | 519.9 | 724.8 |
| 1985 | 16611 | 12173 | 639 | 490 | 313 | 465 | 16949 | 343 | 17293 | 12456 | 514.0 | 713.6 |
| 1986 | 16949 | 12456 | 643 | 494 | 319 | 474 | 17288 | 327 | 17615 | 12739 | 508.4 | 702.9 |
| 1987 | 17288 | 12739 | 646 | 496 | 325 | 483 | 17627 | 311 | 17937 | 13021 | 502.3 | 692.0 |
| 1988 | 17627 | 13021 | 648 | 498 | 331 | 491 | 17964 | 295 | 18259 | 13302 | 496.5 | 681.5 |
| 1989 | 17964 | 13302 | 651 | 500 | 337 | 500 | 18301 | 279 | 18580 | 13581 | 490.9 | 671.6 |
| 1990 | 18301 | 13581 | 652 | 501 | 343 | 509 | 18636 | 264 | 18901 | 13858 | 485.5 | 662.1 |
| 1991 | 18636 | 13858 | 654 | 502 | 349 | 518 | 18970 | 250 | 19219 | 14134 | 480.3 | 653.1 |
| 1992 | 18970 | 14134 | 654 | 502 | 355 | 527 | 19300 | 235 | 19536 | 14407 | 474.5 | 643.4 |
| 1993 | 19300 | 14407 | 653 | 502 | 361 | 535 | 19628 | 221 | 19849 | 14678 | 468.9 | 634.1 |
| 1994 | 19628 | 14678 | 653 | 501 | 367 | 544 | 19953 | 206 | 20159 | 14946 | 463.6 | 625.3 |
| 1995 | 19953 | 14946 | 652 | 501 | 373 | 552 | 20275 | 192 | 20467 | 15211 | 458.5 | 616.9 |
| 1996 | 20275 | 15211 | 651 | 500 | 379 | 561 | 20593 | 178 | 20771 | 15473 | 453.7 | 609.0 |
| 1997 | 20593 | 15473 | 648 | 498 | 385 | 569 | 20906 | 164 | 21070 | 15732 | 448.2 | 600.3 |
| 1998 | 20906 | 15732 | 646 | 496 | 390 | 577 | 21215 | 150 | 21366 | 15987 | 443.1 | 592.1 |
| 1999 | 21215 | 15987 | 643 | 494 | 396 | 585 | 21520 | 137 | 21656 | 16239 | 438.2 | 584.3 |
| 2000 | 21520 | 16239 | 640 | 491 | 402 | 593 | 21819 | 123 | 21942 | 16487 | 433.5 | 576.9 |
| 2001 | 21819 | 16487 | 636 | 488 | 407 | 601 | 22113 | 109 | 22223 | 16730 | 428.6 | 569.3 |

## TABLE 7 (g)

### Projection of Physician Supply to the Year 2001
### — Assumes National Average Fee Level

| | Beginning of Year | | | Additions | | Subtractions | | | End of Year | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | General | FTE | Grads | Lic | Immig | | General | Special | CPSO | FTE | POP/CPSO | POP/FTE |
| 1981 | 15273 | 11016 | 615 | 472 | 258 | 329 | 15675 | 420 | 16095 | 11370 | 535.9 | 758.6 |
| 1982 | 15675 | 11370 | 622 | 478 | 212 | 338 | 16027 | 400 | 16427 | 11668 | 529.1 | 744.9 |
| 1983 | 16027 | 11668 | 628 | 482 | 150 | 345 | 16314 | 380 | 16694 | 11918 | 524.6 | 734.8 |
| 1984 | 16314 | 11918 | 634 | 487 | 107 | 351 | 16558 | 360 | 16917 | 12133 | 521.5 | 727.2 |
| 1985 | 16558 | 12133 | 639 | 490 | 77 | 355 | 16770 | 340 | 17110 | 12324 | 519.5 | 721.2 |
| 1986 | 16770 | 12324 | 643 | 494 | 56 | 359 | 16961 | 321 | 17281 | 12498 | 518.2 | 716.5 |
| 1987 | 16961 | 12498 | 646 | 496 | 42 | 363 | 17136 | 302 | 17438 | 12659 | 516.7 | 711.8 |
| 1988 | 17136 | 12659 | 648 | 498 | 28 | 366 | 17295 | 284 | 17579 | 12806 | 515.7 | 707.9 |
| 1989 | 17295 | 12806 | 651 | 500 | 16 | 369 | 17442 | 266 | 17708 | 12943 | 515.0 | 704.6 |
| 1990 | 17442 | 12943 | 652 | 501 | 9 | 372 | 17580 | 249 | 17829 | 13073 | 514.6 | 701.9 |
| 1991 | 17580 | 13073 | 654 | 502 | 3 | 374 | 17711 | 233 | 17944 | 13196 | 514.4 | 699.5 |
| 1992 | 17711 | 13196 | 654 | 502 | 0 | 377 | 17836 | 217 | 18054 | 13314 | 513.4 | 696.2 |
| 1993 | 17836 | 13314 | 653 | 502 | 0 | 379 | 17959 | 202 | 18161 | 13429 | 512.5 | 693.1 |
| 1994 | 17959 | 13429 | 653 | 501 | 0 | 381 | 18079 | 187 | 18266 | 13542 | 511.7 | 690.1 |
| 1995 | 18079 | 13542 | 652 | 501 | 0 | 384 | 18196 | 173 | 18369 | 13652 | 510.9 | 687.4 |
| 1996 | 18196 | 13652 | 651 | 500 | 0 | 386 | 18310 | 158 | 18469 | 13758 | 510.2 | 684.9 |
| 1997 | 18310 | 13758 | 648 | 498 | 0 | 388 | 18420 | 145 | 18565 | 13862 | 508.7 | 681.4 |
| 1998 | 18420 | 13862 | 646 | 496 | 0 | 390 | 18526 | 131 | 18658 | 13961 | 507.4 | 678.1 |
| 1999 | 18526 | 13961 | 643 | 494 | 0 | 392 | 18628 | 118 | 18746 | 14057 | 506.2 | 675.0 |
| 2000 | 18628 | 14057 | 640 | 491 | 0 | 394 | 18726 | 106 | 18831 | 14149 | 505.1 | 672.2 |
| 2001 | 18726 | 14149 | 636 | 488 | 0 | 395 | 18819 | 93 | 18912 | 14238 | 503.6 | 668.9 |

## TABLE 7 (h)

### Projection of Physician Supply to the Year 2001
### — Assumes Fees Returned to 1972 Position

| | Beginning of Year | | Additions | | | Subtractions | End of Year | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | General | FTE | Grads | Lic | Immig | | General | Special | CPSO | FTE | POP/CPSO | POP/FTE |
| 1981 | 15273 | 11016 | 615 | 472 | 258 | 172 | 15831 | 424 | 16256 | 11484 | 530.6 | 751.1 |
| 1982 | 15831 | 11484 | 622 | 478 | 212 | 179 | 16342 | 408 | 16750 | 11898 | 518.9 | 730.5 |
| 1983 | 16342 | 11898 | 628 | 482 | 116 | 184 | 16757 | 390 | 17147 | 12241 | 510.7 | 715.4 |
| 1984 | 16757 | 12241 | 634 | 487 | 37 | 189 | 17092 | 371 | 17463 | 12525 | 505.2 | 704.4 |
| 1985 | 17092 | 12525 | 639 | 490 | 0 | 192 | 17390 | 352 | 17743 | 12780 | 501.0 | 695.5 |
| 1986 | 17390 | 12780 | 643 | 494 | 0 | 195 | 17689 | 334 | 18023 | 13035 | 496.9 | 687.0 |
| 1987 | 17689 | 13035 | 646 | 496 | 0 | 198 | 17987 | 317 | 18304 | 13287 | 492.3 | 678.1 |
| 1988 | 17987 | 13287 | 648 | 498 | 0 | 201 | 18283 | 300 | 18583 | 13538 | 487.8 | 669.6 |
| 1989 | 18283 | 13538 | 651 | 500 | 0 | 204 | 18579 | 284 | 18862 | 13787 | 483.5 | 661.5 |
| 1990 | 18579 | 13787 | 652 | 501 | 0 | 207 | 18872 | 268 | 19140 | 14034 | 479.4 | 653.8 |
| 1991 | 18872 | 14034 | 654 | 502 | 0 | 211 | 19164 | 252 | 19416 | 14278 | 475.4 | 646.5 |
| 1992 | 19164 | 14278 | 654 | 502 | 0 | 214 | 19452 | 237 | 19689 | 14520 | 470.8 | 638.3 |
| 1993 | 19452 | 14520 | 653 | 502 | 0 | 217 | 19737 | 222 | 19959 | 14759 | 466.3 | 630.6 |
| 1994 | 19737 | 14759 | 653 | 501 | 0 | 220 | 20019 | 207 | 20226 | 14995 | 462.1 | 623.3 |
| 1995 | 20019 | 14995 | 652 | 501 | 0 | 222 | 20297 | 192 | 20490 | 15228 | 458.0 | 616.3 |
| 1996 | 20297 | 15228 | 651 | 500 | 0 | 225 | 20572 | 178 | 20750 | 15458 | 454.1 | 609.6 |
| 1997 | 20572 | 15458 | 648 | 499 | 0 | 228 | 20841 | 164 | 21005 | 15684 | 449.6 | 602.2 |
| 1998 | 20841 | 15684 | 646 | 496 | 0 | 231 | 21106 | 150 | 21256 | 15905 | 445.4 | 595.2 |
| 1999 | 21106 | 15905 | 643 | 494 | 0 | 234 | 21366 | 136 | 21502 | 16123 | 441.3 | 588.5 |
| 2000 | 21366 | 16123 | 640 | 491 | 0 | 237 | 21621 | 122 | 21743 | 16337 | 437.4 | 582.2 |
| 2001 | 21621 | 16337 | 636 | 488 | 0 | 239 | 21870 | 108 | 21978 | 16546 | 433.3 | 575.6 |

## TABLE 7 (l)

### Projection of Physician Supply to the Year 2001
### — Assumes 15 Percent Increase in Grads and Immig/CPSO is Constant at .0188

| | Beginning of Year | | | Additions | | Subtractions | | | End of Year | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | General | FTE | Grads | Lic | Immig | | General | Special | CPSO | FTE | POP/CPSO | POP/FTE |
| 1981 | 15273 | 11016 | 697 | 535 | 288 | 429 | 15667 | 420 | 16087 | 11364 | 536.2 | 759.0 |
| 1982 | 15667 | 11364 | 697 | 535 | 294 | 441 | 16056 | 401 | 16457 | 11690 | 528.1 | 743.5 |
| 1983 | 16056 | 11690 | 697 | 535 | 302 | 451 | 16443 | 383 | 16825 | 12012 | 520.5 | 729.0 |
| 1984 | 16443 | 12012 | 697 | 535 | 309 | 461 | 16826 | 365 | 17192 | 12330 | 513.2 | 715.5 |
| 1985 | 16826 | 12330 | 697 | 535 | 316 | 471 | 17207 | 349 | 17556 | 12646 | 506.3 | 702.9 |
| 1986 | 17207 | 12646 | 697 | 535 | 323 | 481 | 17584 | 332 | 17917 | 12958 | 499.8 | 691.1 |
| 1987 | 17584 | 12958 | 697 | 535 | 330 | 491 | 17959 | 316 | 18275 | 13266 | 493.0 | 679.2 |
| 1988 | 17959 | 13266 | 697 | 535 | 337 | 501 | 18330 | 301 | 18631 | 13572 | 486.6 | 667.9 |
| 1989 | 18330 | 13572 | 697 | 535 | 344 | 510 | 18699 | 286 | 18984 | 13876 | 480.4 | 657.3 |
| 1990 | 18699 | 13876 | 697 | 535 | 350 | 520 | 19064 | 271 | 19334 | 14176 | 474.6 | 647.2 |
| 1991 | 19064 | 14176 | 697 | 535 | 357 | 530 | 19426 | 256 | 19682 | 14474 | 469.0 | 637.7 |
| 1992 | 19426 | 14474 | 697 | 535 | 363 | 539 | 19786 | 241 | 20027 | 14769 | 462.8 | 627.6 |
| 1993 | 19786 | 14769 | 697 | 535 | 370 | 549 | 20142 | 226 | 20369 | 15062 | 456.9 | 617.9 |
| 1994 | 20142 | 15062 | 697 | 535 | 377 | 558 | 20496 | 212 | 20708 | 15352 | 451.3 | 608.8 |
| 1995 | 20496 | 15352 | 697 | 535 | 383 | 567 | 20847 | 198 | 21045 | 15640 | 445.9 | 600.0 |
| 1996 | 20847 | 15640 | 697 | 535 | 389 | 577 | 21195 | 183 | 21378 | 15926 | 440.8 | 591.7 |
| 1997 | 21195 | 15926 | 697 | 535 | 396 | 586 | 21540 | 169 | 21709 | 16209 | 435.1 | 582.7 |
| 1998 | 21540 | 16209 | 697 | 535 | 402 | 595 | 21882 | 155 | 22038 | 16490 | 429.6 | 674.1 |
| 1999 | 21882 | 16490 | 697 | 535 | 408 | 604 | 22222 | 141 | 22363 | 16769 | 424.3 | 565.9 |
| 2000 | 22222 | 16769 | 697 | 535 | 414 | 613 | 22559 | 127 | 22686 | 17046 | 419.2 | 558.0 |
| 2001 | 22559 | 17046 | 697 | 535 | 420 | 622 | 22893 | 113 | 23006 | 17320 | 414.0 | 549.9 |

## TABLE 8

### Summary of Weighted Average Time Requirements by Physician Services

| Physician Services | Total Number of Procedures | Weighted Average Time Requirements (min.) | Total of Procedures Multiplied by Time Requirements |
|---|---|---|---|
| Consultation | 2,646,590 | 51.0 | 36,084,963 |
| Complete Exams | 6,033,080 | 37.8 | 228,248,808 |
| Office Visits | 31,892,881 | 16.0 | 511,163,800 |
| Hospital Visits | 7,440,216 | 13.0 | 96,313,461 |
| Home Visits | 2,405,692 | 20.0 | 48,073,840 |
| Psychotherapy | 3,608,448 | 30.0 | 108,253,440 |
| Major Surgery | 818,787 | 126.4 | 103,481,220 |
| Minor Surgery | 1,384,814 | 27.0 | 37,563,935 |
| Surgical Assistance | 2,135,453 | 8.0 | 17,163,624 |
| Obstetric Services | 119,723 | 239.0 | 28,613,797 |
| Anesthesia | 8,189,230 | 8.0 | 65,513,840 |
| Diagnostic Radiology | 3,989,705 | 7.0 | 27,927,935 |
| Other Diagnostic/ Therapeutic Services | 16,377,820 | 10.3 | 168,641,633 |
| Miscellaneous Services | 23,386 | 10.4 | 243,088 |
| TOTAL | 87,063,825 | 18.1 | 1,577,287,384 |

*Data Sources*

Number of Procedures: OHIP billed services as reported in "Distribution of Physician Services by Type of Service and Specialty, 1980."

Time Requirement: Miscellaneous reports to the Requirements Committee of the National Committee on Physician Manpower, 1975.

## TABLE 9

### The Actual Average Physician Workload, In Hours Per Year, Ontario, 1980

| Specialty | Number of Physicians Billing OHIP | Actual Number of Hours Worked Per Year | Total |
|---|---|---|---|
| General Practice | 6730 | 2544 | 17,121,120 |
| Anesthesia | 541 | 2585 | 1,398,485 |
| Dermatology | 138 | 2208 | 304,704 |
| General Surgery | 690 | 2832 | 1,954,080 |
| Neurosurgery | 53 | 3168 | 167,904 |
| Orthopedic Surgery | 259 | 2784 | 721,056 |
| Plastic Surgery | 89 | 2688 | 239,232 |
| Thoracic-Card. Surgery | 33 | 2914 | 96,162 |
| Internal Medicine | 1134 | 2688 | 3,048,192 |
| Neurology | 105 | 2784 | 292,320 |
| Psychiatry | 855 | 2350 | 2,009,250 |
| Ob/Gyn | 533 | 2640 | 1,407,120 |
| Ophthalmology | 291 | 2482 | 722,262 |
| Otolaryngology | 201 | 2303 | 462,903 |
| Pediatrics | 471 | 2496 | 1,175,616 |
| Pathology | — | NA | — |
| Physcial Medicine | 53 | 2397 | 127,041 |
| Diagnostic Radiology | 423 | 2401 | 1,015,623 |
| Therapeutic Radiology | — | NA | — |
| Urology | 154 | 2928 | 450,912 |
| Sum/Weighted Average | 12,753 | 2565 | 32,713,982 |

*Data Sources:*

Number of physicians billing OHIP — OHIP, 1980; actual number of hours worked per ye — Erin Holmes, "O.M.A. Income Survey: No Surprises in 1980," Ontario Medical Associ tion, June 1982.

## TABLE 10

### Calculation for Weighted Average Utilization Costs Per Person For Projected Population — 1991 & 2001

| | 1991 | | | 2001 | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (1) | (2) | (3) |
| Age Group | Population Projection[1] | Utilization Costs Per Person in 1980[2] | Total (1) x (2) | Population Projection[1] | Utilization Costs Per Person in 1980[1] | Total (1) x (2) |
| 0–4 | 580,743 | $101.28 | 58,817,651.04 | 491,148 | $101.28 | 49,743,469.44 |
| 5–9 | 599,262 | 67.39 | 40,384,266.10 | 537,826 | 67.39 | 36,244,094.14 |
| 10–14 | 599,352 | 55.28 | 33,132,178.56 | 586,368 | 55.28 | 32,414,423.04 |
| 15–19 | 614,087 | 77.08 | 47,333,825.96 | 604,100 | 77.08 | 46,564,028.00 |
| 20–24 | 677,076 | 103.14 | 69,833,618.64 | 606,291 | 103.14 | 62,532,853.74 |
| 25–29 | 810,949 | 124.33 | 100,825,289.20 | 626,456 | 124.33 | 77,887,274.48 |
| 30–34 | 822,356 | 126.09 | 103,690,868.00 | 688,500 | 126.09 | 86,812,965.00 |
| 35–39 | 755,009 | 119.95 | 90,563,329.55 | 814,190 | 119.95 | 97,662,090.50 |
| 40–44 | 715,824 | 120.25 | 86,077,836.00 | 817,050 | 120.25 | 98,250,262.50 |
| 45–49 | 577,910 | 127.36 | 73,602,617.60 | 742,340 | 127.36 | 94,544,422.40 |
| 50–54 | 473,403 | 140.40 | 66,465,781.20 | 693,506 | 140.40 | 97,368,242.40 |
| 55–59 | 444,720 | 153.95 | 68,464,644.00 | 547,883 | 153.95 | 84,346,587.85 |
| 60–64 | 423,582 | 171.74 | 72,745,972.68 | 434,376 | 171.74 | 74,599,734.24 |
| 65–69 | 391,822 | 192.02 | 75,237,660.44 | 388,225 | 192.02 | 74,546,964.50 |
| 70–74 | 282,920 | 212.08 | 60,001,673.60 | 342,673 | 212.08 | 72,674,089.84 |
| 75–79 | 214,569 | 233.95 | 50,198,417.55 | 284,436 | 233.95 | 66,543,802.20 |
| 80–84 | 138,175 | 256.19 | 35,399,053.25 | 174,924 | 256.19 | 44,813,779.56 |
| 85+ | 108,866 | 283.63 | 30,877,663.58 | 152,643 | 283.63 | 43,294,134.09 |
| Sum/Weighted Average | 9,230,625 | $126.06 | 1,163,652,347.00 | 9,532,935 | $130.16 | 1,240,843,218.00 |

Weighted Average Utilization Costs per Person = Sum of (3)
Sum of (1)

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[1] Population projections from *STATS, CANADA*, 1982

[2] 1980 Utilization costs per person from Ontario Ministry of Health, OHIP Statistical Reporting System, Physician/Practitioner Activity by Age/Sex Distribution of Patients (per capita cost), 1980.

## TABLE 11

### Alternative Projections For The Percentage of Physicians Who Are Female, To The Year 2001

### Assumes 35 Percent of Additions are Female

| Year | Percentage Female |
|---|---|
| 1980[1] | 12.8% |
| 1981 | 13.8 |
| 1982 | 14.7 |
| 1983 | 15.5 |
| 1984 | 16.3 |
| 1985 | 17.0 |
| 1986 | 17.7 |
| 1987 | 18.4 |
| 1988 | 19.0 |
| 1989 | 19.6 |
| 1990 | 20.1 |
| 1991 | 20.7 |
| 1992 | 21.2 |
| 1993 | 21.7 |
| 1994 | 22.1 |
| 1995 | 22.5 |
| 1996 | 22.9 |
| 1997 | 23.3 |
| 1998 | 23.6 |
| 1999 | 24.0 |
| 2000 | 24.3 |
| 2001 | 24.6 |

[1] Actual value obtained from the Ontario Physician Manpower Data Centre.

## TABLE 12

## The Optimum Average Physician Workload, In Hours Per Year

| Specialty | (1) Number of Physicians Billing OHIP | (2) Optimal Number of Hours Worked Per Year | (1) x (2) |
|---|---|---|---|
| General Practice | 6730 | 2254 | 15,169,420 |
| Anesthesia | 541 | 2448 | 1,324,368 |
| Dermatology | 138 | 1992 | 274,896 |
| General Surgery | 690 | 2475 | 1,707,750 |
| Neurosurgery | 53 | 2530 | 134,090 |
| Orthopedic Surgery | 259 | 2070 | 536,130 |
| Plastic Surgery | 89 | 2043 | 181,818 |
| Cardio-Thorc. Surgery | 33 | 2116 | 69,828 |
| Internal Medicine | 1134 | 2208 | 2,503,872 |
| Neurology | 105 | 1840 | 193,200 |
| Psychiatry | 855 | 2160 | 1,846,800 |
| Ob/Gyn | 533 | 2208 | 1,176,864 |
| Ophthalmology | 291 | 2151 | 625,941 |
| Otolaryngology | 201 | 2070 | 416,070 |
| Pediatrics | 471 | 2208 | 1,039,968 |
| Pathology | 51 | 1980 | 100,980 |
| Physical Medicine | 53 | 1800 | 95,400 |
| Diagnostic Radiology | 423 | 2300 | 972,900 |
| Therapeutic Radiology | 45 | 1840 | 82,800 |
| Urology | 154 | 2392 | 368,368 |
| Sum/Weighted Average | 12,849 | 2243 | 28,821,463 |

*Data Sources:*
Number of physicians billing OHIP — OHIP, 1980; optimal number of hours worked per year — miscellaneous reports of the Requirements Committee of the National Committee on Physician Manpower, 1975.

## TABLE 13

### Calculating The Number of Physicians Required In Ontario Using the Michigan Model, 1981

| Community Size | Population | Physician-to-Population Ratio | Number of Physicians |
|---|---|---|---|
| 50,000 or more | 4,808,315 | 95 per 100,000 | 4,568 |
| 20,000–50,000[1] | 899,648 | 106.4 per 100,000[1] | 957 |
| <20,000[2] | 2,517,137 | 119.2 per 100,000[2] | 3,000 |
| Underserved[3] | 400,000 | 250 per 100,000[3] | 1,000 |
| | | | 9,525 |
| **Age Adjustment**<br>9,525 x 1.044 = | | | 9,944 |
| **Out-of-Plan Adjustment**[4]<br>9,944 x 1.10 = | | | 10,938 |
| **Institutional Requirements** | | | |
| • Psychiatric hospitals | | 172 | |
| • Children's facilities | | 9 | |
| • Mental retardation | | 41 | |
| • Public health | | 55 | |
| | | | 277 |
| | | | 11,215 |

[1] The Michigan study concludes that medium-size HMOs have a 12 percent greater staffing ratio, but arbitrarily reduces the adjustment to six percent. We use a 12 percent factor.

[2] Staffing ratio assumed to be 12 percent greater than for medium-size HMOs.

[3] Uses approximate actual physician-to-population ratio.

[4] Follows the assumption made in the Michigan report, namely, that HMO members receive 10 percent of health care services from other sources.

*Sources:*

Population by community size from Canada Ministry of Supply and Services, "1981 Census of Canada: Census Subdivisions in Decreasing Population Order," May 1982.

Institutional requirements from Data Development and Evaluation Branch, Ontario Ministry of Health. Age adjustment factor developed in Table 14.

## TABLE 14

### Calculation of Age Adjustment Factors For The Michigan Model

|  | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
|  | H.I.P. Ambulatory Visit Plus Hospital Visit Rates (average visits per person per year) | Average Age Distribution of Large Prepaid Groups | Ontario Age Distribution |  |  |
| Age Group |  |  | 1981 | 1991 | 2001 |
| 0–4 | 5.9 | 7.4% | 5.55% | 6.29% | 5.15% |
| 5–14 | 3.3 | 21.6% | 15.21% | 12.98% | 11.79% |
| 15–24 | 3.4 | 18.2% | 18.80% | 13.99% | 12.70% |
| 25–44 | 4.3 | 25.9% | 29.74% | 33.63% | 30.90% |
| 45–64 | 5.3 | 21.1% | 20.49% | 20.80% | 25.36% |
| 65+ | 8.4 | 5.9% | 10.21% | 12.31% | 14.10% |

**Formula:**

$$1981 = \frac{\text{Sum of columns (1) x (3)}}{\text{Sum of columns (1) x (2)}} = \frac{469.01}{449.11} = 1.0443 \text{ or } 4.4\%$$

$$1991 = \frac{\text{Sum of columns (1) x (4)}}{\text{Sum of columns (1) x (2)}} = \frac{485.76}{449.11} = 1.082 \text{ or } 8.2\%$$

$$2001 = \frac{\text{Sum of columns (1) x (5)}}{\text{Sum of columns (1) x (2)}} = \frac{498.19}{449.11} = 1.109 \text{ or } 10.9\%$$

*Sources:*

Columns (1) and (2) — State of Michigan, Office of Health and Medical Affairs, "Planning for Physician Requirements and Supply in Michigan," May 1981, Table A-7. Columns (3), (4), and (5) — Stats Canada.

## TABLE B-1
## The Estimated Physician Time Requirements For OHIP-Billed Services, in Minutes, 1980

| | 1. CONSULTATION | | | 2. COMPLETE EXAMS | | |
|---|---|---|---|---|---|---|
| Specialty | Number of Units | Time Requirement | (1) x (2) | Number of Units | Time Requirement | (1) x (2) |
| General Practice | 82,891 | 45 | 3,730,095 | 2,560,787 | 45 | 115,235,415 |
| Anesthesia | 6,402 | 51* | 326,502 | 10,125 | 38* | 384,750 |
| Dermatology | 151,511 | 20 | 3,030,220 | 168,381 | 15 | 2,525,715 |
| General Surgery | 341,558 | 50 | 17,077,900 | 280,361 | 40 | 11,214,440 |
| Neurosurgery | 25,156 | 60 | 1,509,360 | 17,028 | 30 | 510,840 |
| Orthopedic Surgery | 212,408 | 30 | 6,372,240 | 181,219 | 20 | 3,624,380 |
| Plastic Surgery | 60,685 | 20 | 1,213,700 | 42,133 | 38* | 1,601,054 |
| Cardio-Thoracic Surgery | 11,633 | 60 | 697,980 | 4,992 | 60 | 299,520 |
| Internal Medicine | 595,334 | 75 | 44,650,050 | 754,314 | 50 | 37,715,700 |
| Neurology | 89,360 | 60 | 5,361,600 | 52,072 | 60 | 3,124,320 |
| Psychiatry | 85,203 | 90 | 7,668,270 | 27,493 | 75 | 2,061,975 |
| Obstetrics & Gynecology | 241,610 | 45 | 10,872,450 | 401,106 | 35 | 14,038,710 |
| Ophthalmology | 209,694 | 40 | 8,387,760 | 911,294 | 19 | 17,314,586 |
| Otolaryngology | 215,151 | 30 | 6,454,530 | 150,303 | 20 | 3,006,060 |
| Pediatrics | 167,856 | 70 | 11,749,920 | 357,390 | 30 | 10,721,700 |
| Pathology | 1,598 | 51* | 81,498 | 363 | 38* | 13,794 |
| Physical Medicine | 23,828 | 51* | 1,215,228 | 23,770 | 38* | 903,260 |
| Diagnostic Radiology | 1,429 | 51* | 72,879 | 243 | 38* | 9,234 |
| Therapeutic Radiology | 10,841 | 51* | 552,891 | 13,345 | 38* | 507,110 |
| Urology | 112,442 | 45 | 5,059,890 | 76,361 | 45 | 3,436,245 |
| Sum/Weighted Average | 2,646,590 | 51 | 36,084,963 | 6,033,080 | 37.8 | 228,248,808 |

*Not available; missing value filled by Arthur D. Little, Inc.

*Data Sources:*
Numbers of procedures — reclassification of OHIP services as reported in "Distribution of Physician Services by Type of Service and Specialty, 1980," (see Table 10 for reclassification); the time requirement per procedure — miscellaneous reports of the Requirements Committee of the National Committee on Physician Manpower, 1975

## TABLE B-1 (continued)
## The Estimated Physician Time Requirements For OHIP-Billed Services, in Minutes, 1980

| | 3. OFFICE VISITS | | | 4. HOSPITAL VISITS | | |
|---|---|---|---|---|---|---|
| **Specialty** | **Number of Units** | **Time Requirement** | **(1) x (2)** | **Number of Units** | **Time Requirement** | **(1) x (2)** |
| General Practice | 27,830,283 | 16 | 445,284,528 | 3,304,691 | 10 | 33,046,910 |
| Anesthesia | 63,604 | 20* | 1,272,080 | 24,285 | 15* | 364,275 |
| Dermatology | 475,231 | 8 | 3,801,848 | 23,663 | 30 | 709,890 |
| General Surgery | 671,651 | 20 | 13,483,020 | 480,104 | 10 | 4,801,040 |
| Neurosurgery | 4,807 | 30 | 144,210 | 61,542 | 15 | 923,130 |
| Orthopedic Surgery | 241,237 | 15 | 3,618,555 | 71,159 | 10 | 711,590 |
| Plastic Surgery | 80,419 | 7 | 562,933 | 20,810 | 12 | 249,720 |
| Cardio-Thoracic Surgery | 2,996 | 20* | 59,920 | 17,595 | 15* | 263,925 |
| Internal Medicine | 472,632 | 20 | 9,452,640 | 1,993,591 | 15 | 29,903,865 |
| Neurology | 10,524 | 30 | 315,720 | 145,876 | 15 | 2,188,140 |
| Psychiatry | 88,490 | 30 | 2,654,700 | 374,635 | 15 | 5,619,525 |
| Obstetrics & Gynecology | 307,566 | 15 | 4,613,490 | 116,843 | 15 | 1,752,645 |
| Ophthalmology | 251,411 | 10 | 2,514,110 | 9,953 | 25 | 248,825 |
| Otolaryngology | 247,150 | 10 | 2,471,500 | 24,657 | 15 | 369,855 |
| Pediatrics | 966,527 | 18 | 17,397,486 | 448,103 | 22 | 9,858,266 |
| Pathology | 5,435 | 20* | 108,700 | 418 | 15* | 6,270 |
| Physical Medicine | 17,030 | 20* | 340,600 | 212,732 | 15* | 3,190,980 |
| Diagnostic Radiology | 746 | 20* | 14,920 | 159 | 15* | 2,385 |
| Therapeutic Radiology | 17,760 | 20* | 355,200 | 17,155 | 15* | 257,325 |
| Urology | 137,382 | 20 | 2,747,640 | 92,245 | 20 | 1,844,900 |
| Sum/Weighted Average | 31,892,881 | 16 | 511,163,800 | 7,440,216 | 13 | 96,313,461 |

*Not available; missing value filled by Arthur D. Little, Inc.

## TABLE B-1 (continued)

## The Estimated Physician Time Requirements For OHIP-Billed Services, in Minutes, 1980

| | 5. HOME VISITS | | | 6. PSYCHOTHERAPY | | |
|---|---|---|---|---|---|---|
| Specialty | Number of Units | Time Requirement | (1) x (2) | Number of Units | Time Requirement | (1) x (2) |
| General Practice | 1,963,862 | 20 | 39,277,240 | 1,527,895 | 30 | 45,836,850 |
| Anesthesia | 10,032 | 20 | 200,640 | 6,412 | 30 | 192,360 |
| Dermatology | 3,956 | 20 | 79,120 | 231 | 30 | 6,930 |
| General Surgery | 101,544 | 20 | 2,030,880 | 5,683 | 30 | 170,490 |
| Neurosurgery | 4,114 | 20 | 82,280 | 159 | 30 | 4,770 |
| Orthopedic Surgery | 20,067 | 20 | 401,340 | 2,365 | 30 | 70,950 |
| Plastic Surgery | 5,575 | 20 | 111,500 | 4 | 30 | 120 |
| Cardio-Thoracic Surgery | 820 | 20 | 16,400 | 25 | 30 | 750 |
| Internal Medicine | 110,911 | 20 | 2,218,220 | 23,187 | 30 | 695,610 |
| Neurology | 6,920 | 20 | 138,400 | 828 | 30 | 24,480 |
| Psychiatry | 11,986 | 20 | 239,720 | 1,980,429 | 30 | 59,412,870 |
| Obstetrics & Gynecology | 31,995 | 20 | 639,900 | 17,393 | 30 | 521,790 |
| Ophthalmology | 10,238 | 20 | 204,760 | 110 | 30 | 3,300 |
| Otolaryngology | 13,830 | 20 | 276,600 | 525 | 30 | 15,750 |
| Pediatrics | 92,429 | 20 | 1,848,580 | 40,628 | 30 | 1,218,840 |
| Pathology | 289 | 20 | 5,780 | 293 | 30 | 8,790 |
| Physical Medicine | 491 | 20 | 9,820 | 1,321 | 30 | 39,630 |
| Diagnostic Radiology | 73 | 20 | 1,460 | 1 | 30 | 30 |
| Therapeutic Radiology | 181 | 20 | 3,620 | 7 | 30 | 210 |
| Urology | 14,379 | 20 | 287,580 | 952 | 30 | 28,560 |
| Sum/Weighted Average | 2,405,692 | 20 | 48,073,840 | 3,608,448 | 30 | 108,253,440 |

*Not available; missing value filled by Arthur D. Little, Inc.

**TABLE B-1 (continued)**
**The Estimated Physician Time Requirements For OHIP-Billed Services, in Minutes, 1980**

| Specialty | 7. MAJOR SURGERY<br>Number of Units | Time Requirement | (1) x (2) | 8. MINOR SURGERY<br>Number of Units | Time Requirement | (1) x (2) |
|---|---|---|---|---|---|---|
| General Practice | 125,884 | 60 | 7,553,040 | 765,016 | 25 | 19,125,400 |
| Anesthesia | 2,616 | 60* | 156,960 | 3,270 | 25* | 81,750 |
| Dermatology | — | — | — | 290,705 | 20 | 5,814,100 |
| General Surgery | 232,128 | 85 | 19,730,880 | 108,086 | 30 | 3,242,500 |
| Neurosurgery | 11,950 | 420 | 5,019,000 | — | — | — |
| Orthopedic Surgery | 104,621 | 120 | 12,554,520 | 38,149 | 60 | 2,288,940 |
| Plastic Surgery | 50,321 | 180 | 9,057,780 | 30,503 | 25 | 762,575 |
| Cardio-Thoracic Surgery | 14,038 | 450 | 6,317,100 | — | — | — |
| Internal Medicine | 23,495 | 60* | 1,409,700 | 29,374 | 25* | 734,350 |
| Neurology | 77 | 60* | 4,620 | — | — | — |
| Psychiatry | 48 | 60* | 2,880 | 61 | 25* | 1,525 |
| Obstetrics & Gynecology | 62,091 | 150 | 9,313,650 | 11,053 | 45 | 497,385 |
| Ophthalmology | 37,468 | 210 | 7,868,280 | 17,600 | 90 | 1,584,000 |
| Otolaryngology | 95,365 | 150 | 14,304,750 | 64,673 | 30 | 1,940,190 |
| Pediatrics | 576 | 60 | 34,560 | 14,536 | 35 | 508,760 |
| Pathology | 531 | 60* | 31,860 | 664 | 25* | 16,600 |
| Physical Medicine | 97 | 60* | 5,820 | 121 | 25* | 3,025 |
| Diagnostic Radiology | 1,542 | 60* | 92,520 | 1,361 | 25* | 34,025 |
| Therapeutic Radiology | 381 | 60* | 22,860 | 1,046 | 25* | 26,150 |
| Urology | 55,558 | 180 | 10,000,440 | 8,596 | 105 | 902,508 |
| Sum/Weighted Average | 818,787 | 126.4 | 103,481,220 | 1,384,814 | 27 | 37,563,935 |

*Not available; missing value filled by Arthur D. Little, Inc.

## TABLE B-1 (continued)
### The Estimated Physician Time Requirements For OHIP-Billed Services, in Minutes, 1980

| Specialty | 9. SURGICAL ASSISTANCE<br>Number of Units | <br>Time Requirement | <br>(1) x (2) | 10. OBSTETRIC SERVICES<br>Number of Units | <br>Time Requirement | <br>(1) x (2) |
|---|---|---|---|---|---|---|
| General Practice | 1,689,309 | 8 | 13,514,472 | | | |
| Anesthesia | 29,495 | 8 | 235,960 | | N | |
| Dermatology | 9 | 8 | 72 | | O | |
| General Surgery | 211,749 | 8 | 1,773,992 | | T | |
| Neurosurgery | 11,750 | 8 | 94,000 | | | |
| Orthopedic Surgery | 27,079 | 8 | 216,632 | | A | |
| Plastic Surgery | 5,484 | 8 | 43,872 | | V | |
| Cardio-Thoracic Surgery | 22,045 | 8 | 176,360 | | A | |
| Internal Medicine | 7,960 | 8 | 63,680 | | I | |
| Neurology | 100 | 8 | 800 | | L | |
| Psychiatry | — | 8 | — | | A | |
| Obstetrics & Gynecology | 84,500 | 8 | 676,000 | | B | |
| Ophthalmology | 16,773 | 8 | 134,184 | | L | |
| Otolaryngology | 5,923 | 8 | 47,384 | | E | |
| Pediatrics | 2,763 | 8 | 22,104 | | | |
| Pathology | 20 | 8 | 160 | | | |
| Physical Medicine | 32 | 8 | 256 | | | |
| Diagnostic Radiology | 162 | 8 | 1,296 | | | |
| Therapeutic Radiology | — | 8 | — | | | |
| Urology | 20,300 | 8 | 162,400 | | | |
| Sum/Weighted Average | 2,135,453 | 8 | 17,163,624 | 119,723 | 239 | 28,613,797 |

*Not available; missing value filled by Arthr D. Little, Inc.

## TABLE B-1 (continued)
## The Estimated Physician Time Requirements For OHIP-Billed Services, in Minutes, 1980

| | 11. ANESTHESIA | | | 12. DIAGNOSTIC RADIOLOGY | | |
|---|---|---|---|---|---|---|
| Specialty | Number of Units | Time Requirement | (1) x (2) | Number of Units | Time Requirement | (1) x (2) |
| General Practice | 2,218,456 | 8 | 17,747,648 | 90,706 | 7 | 634,942 |
| Anesthesia | 5,967,490 | 8 | 47,739,920 | 37,351 | 7 | 261,457 |
| Dermatology | 7 | 8 | 56 | 1 | 7 | 7 |
| General Surgery | 1,802 | 8 | 14,416 | 600 | 7 | 4,200 |
| Neurosurgery | 88 | 8 | 704 | 304 | 7 | 2,128 |
| Orthopedic Surgery | 101 | 8 | 808 | 11,407 | 7 | 79,849 |
| Plastic Surgery | — | 8 | — | 2 | 7 | 14 |
| Cardio-Thoracic Surgery | 19 | 8 | 152 | 79 | 7 | 553 |
| Internal Medicine | 194 | 8 | 1,552 | 7,206 | 7 | 50,442 |
| Neurology | — | 8 | — | 33 | 7 | 231 |
| Psychiatry | 33 | 8 | 264 | 8 | 7 | 56 |
| Obstetrics & Gynecology | 628 | 8 | 5,024 | 165 | 7 | 1,155 |
| Ophthalmology | 139 | 8 | 1,112 | 38 | 7 | 266 |
| Otolaryngology | 131 | 8 | 1,048 | 14 | 7 | 98 |
| Pediatrics | — | 8 | — | 8 | 7 | 56 |
| Pathology | 10 | 8 | 80 | — | 7 | — |
| Physical Medicine | — | 8 | — | 2 | 7 | 14 |
| Diagnostic Radiology | 1 | 8 | 8 | 3,841,314 | 7 | 26,889,198 |
| Therapeutic Radiology | — | 8 | — | 100 | 7 | 700 |
| Urology | 131 | 8 | 1,048 | 367 | 7 | 2,569 |
| Sum/Weighted Average | 8,189,230 | 8 | 65,513,840 | 3,989,705 | 7 | 27,927,935 |

*Not available; missing value filled by Arthur D. Little, Inc.

## TABLE B-1 (continued)
## The Estimated Physician Time Requirements For OHIP-Billed Services, in Minutes, 1980

| | 13. OTHER DIAGNOSTIC/ THERAPEUTIC SERVICES | | | 14. MISCELLANEOUS SERVICES | | | TOTALS | | |
|---|---|---|---|---|---|---|---|---|---|
| Specialty | Number of Units | Time Requirement | (1) x (2) | Number of Units | Time Requirement | (1) x (2) | (1) Number of Procedures | (2) Time Requirement | (3) (1) x (2) |
| General Practice | 7,660,453 | 5 | 38,302,265 | 22,534 | 10* | 225,340 | NOT AVAILABLE | | |
| Anesthesia | 106,132 | 16* | 1,698,112 | 7 | 10* | 70 | | | |
| Dermatology | 173,197 | 15 | 2,597,955 | 9 | 5 | 45 | | | |
| General Surgery | 261,826 | 10 | 2,618,260 | 333 | 10* | 3,330 | | | |
| Neurosurgery | 7,213 | 16* | 115,408 | 2 | 10* | 20 | | | |
| Orthopedic Surgery | 60,199 | 45 | 2,708,955 | 14 | 20 | 280 | | | |
| Plastic Surgery | 7,171 | 7 | 50,197 | 9 | 7 | 63 | | | |
| Cardio-Thoracic Surgery | 5,909 | 16* | 94,544 | — | — | — | | | |
| Internal Medicine | 3,580,164 | 16 | 57,282,624 | 121 | 10* | 1,210 | | | |
| Neurology | 101,534 | 35 | 3,553,690 | 31 | 10* | 310 | | | |
| Psychiatry | 21,839 | 20 | 436,780 | 6 | 10* | 60 | | | |
| Obstetrics & Gynecology | 267,747 | 40 | 10,709,880 | 34 | 40 | 1,360 | | | |
| Ophthalmology | 111,828 | 33 | 3,690,324 | 6 | 10* | 60 | | | |
| Otolaryngology | 859,131 | 15 | 12,886,965 | 17 | 10 | 170 | | | |
| Pediatrics | 2,727,377 | 7 | 19,091,639 | 185 | 28 | 5,180 | | | |
| Pathology | 41,042 | 16* | 656,672 | 1 | 10* | 10 | | | |
| Physical Medicine | 43,721 | 16* | 699,536 | — | — | — | | | |
| Diagnostic Radiology | 227,077 | 16* | 3,633,232 | 2 | 10* | 20 | | | |
| Therapeutic Radiology | 12,795 | 16* | 204,720 | 1 | 10* | 10 | | | |
| Urology | 101,465 | 75 | 7,609,875 | 74 | 75 | 5,550 | | | |
| Sum/Weighted Average | 16,377,820 | 10.3 | 168,641,633 | 23,386 | 10.4 | 243,088 | 87,063,825 | 18.1 | 1,577,287,384 |

*Not available; missing value filled by Arthur D. Little, Inc.

## TABLE B-2

### General Scheme for Reclassification of OHIP Service Categories Into The Requirements Committee Categories

| FRS Categories | OHIP Categories |
|---|---|
| (1) Consultations | Consultations |
| (2) Complete Exams | Major Assessment<br>Major Reassessment |
| (3) Office Visits | Intermediate Assessment<br>Minor Assessment<br>Other Physician Visits<br>Emergency Department |
| (4) Hospital Visits | Hospital Care |
| (5) Home Visits | Special Visits |
| (6) Major Surgery<br>(7) Minor Surgery | Surgical Procedures[1] |
| (8) Surgical Assistance | Assistant Services |
| (9) Obstetric Services | Obstetric Procedures |
| (10) Anesthesia | Anesthesia Services |
| (11) Other Diagnostic/Therapeutic Services | Other Diagnostic & Therapeutic Procedures |
| (12) Miscellaneous Services | Other Procedures |
| (13) Diagnostic Radiology | Diagnostic Radiology Procedures |

[1] The OHIP data source did not distinguish major and minor surgeries; the numbers of major and minor surgeries were estimated for each specialty based on the distribution found by the Requirements Committee. For example, the Requirements Committee reported that 86 percent of surgeries performed by general practice physicians in Canada are minor surgery, and we assume that the proportionality is the same for Ontario.

## EXHIBIT 1

**Ontario Ministry of Health**
**O.H.I.P. Statistical Reporting System**

**Physician/Practitioner Distribution Based on O.H.I.P. Payments (Ont. Licensed Only)**
**Reporting on Service Months April 1980 to March 1981 (Data Accumulation — 7 Months)**

| Type of | (Payment Ranges Expressed in Ten-thousands of Dollars) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Physician/Practitioner | <1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-6 | 6-7 | 7-8 | 8-9 | 9-10 | 10-11 | 11-12 | 12-13 | 13-14 | 14-15 | >15 | TOTAL |
| 00 General Practice | 961 | 451 | 373 | 333 | 399 | 445 | 507 | 586 | 637 | 559 | 462 | 377 | 265 | 195 | 133 | 250 | 693 |
| 01 Anaesthesia | 24 | 19 | 14 | 25 | 20 | 54 | 97 | 84 | 76 | 53 | 32 | 20 | 7 | 7 | 4 | 8 | 552 |
| 02 Dermatology | 9 | 1 | 4 | 3 | 7 | 4 | 5 | 8 | 9 | 8 | 10 | 10 | 9 | 14 | 11 | 27 | 139 |
| 03 General Surgery | 55 | 20 | 28 | 14 | 25 | 28 | 43 | 48 | 50 | 57 | 57 | 53 | 57 | 35 | 25 | 96 | 691 |
| 04 Neurosurgery | 3 | 0 | 0 | 4 | 3 | 1 | 1 | 5 | 7 | 9 | 6 | 5 | 0 | 1 | 1 | 7 | 53 |
| 06 Orthopaedic Surgery | 19 | 4 | 8 | 4 | 6 | 9 | 9 | 14 | 14 | 28 | 21 | 26 | 29 | 22 | 8 | 42 | 263 |
| 08 Plastic Surgery | 2 | 4 | 3 | 3 | 2 | 1 | 6 | 12 | 8 | 9 | 7 | 8 | 9 | 3 | 4 | 13 | 94 |
| 09 Thorac & Cardiov Surg. | 2 | 0 | 2 | 2 | 0 | 0 | 1 | 1 | 1 | 1 | 3 | 1 | 5 | 1 | 1 | 14 | 35 |
| 13 Internal Medicine | 100 | 73 | 63 | 70 | 64 | 66 | 68 | 88 | 68 | 73 | 58 | 69 | 50 | 38 | 32 | 187 | 1167 |
| 18 Neurology | 8 | 9 | 3 | 5 | 6 | 13 | 4 | 3 | 12 | 5 | 3 | 6 | 3 | 2 | 4 | 25 | 111 |
| 19 Psychiatry | 101 | 53 | 60 | 66 | 81 | 76 | 111 | 94 | 71 | 53 | 48 | 37 | 22 | 10 | 5 | 10 | 898 |
| 20 Obstetrics & Gynaec. | 28 | 10 | 17 | 20 | 22 | 20 | 29 | 32 | 39 | 44 | 53 | 40 | 33 | 24 | 34 | 85 | 538 |
| 23 Ophthalmology | 9 | 2 | 10 | 6 | 3 | 7 | 14 | 19 | 15 | 27 | 30 | 24 | 32 | 28 | 14 | 53 | 293 |
| 24 Otolaryngology | 7 | 5 | 5 | 3 | 2 | 6 | 13 | 6 | 11 | 11 | 18 | 15 | 10 | 15 | 13 | 61 | 201 |
| 26 Paediatrics | 60 | 33 | 29 | 30 | 27 | 25 | 27 | 25 | 27 | 30 | 32 | 33 | 21 | 18 | 14 | 61 | 492 |
| 28 Pathology | 38 | 1 | 4 | 2 | 1 | 4 | 3 | 3 | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 53 | 126 |
| 29 Microbiology | 5 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 7 |
| 31 Physical Medicine | 4 | 8 | 5 | 4 | 3 | 7 | 2 | 6 | 3 | 7 | 1 | 1 | 1 | 1 | 2 | 1 | 56 |
| 33 Diag. Radiology | 53 | 21 | 17 | 22 | 19 | 16 | 12 | 12 | 11 | 6 | 7 | 14 | 10 | 7 | 5 | 202 | 434 |
| 34 Therap. Radiology | 13 | 10 | 14 | 4 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 49 |
| 35 Urology | 3 | 4 | 2 | 2 | 5 | 8 | 13 | 3 | 8 | 12 | 19 | 12 | 16 | 10 | 10 | 30 | 157 |
| Sub-Total Physicians | 1504 | 736 | 662 | 622 | 708 | 791 | 965 | 1049 | 1071 | 995 | 869 | 753 | 581 | 433 | 322 | 1228 | 13289 |

*Source:* O.H.I.P. Statistical Reporting System. See text for explanation.

## EXHIBIT 2

### General Model

|  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|
| Description | Projected Active Supply | = | [ Base | + | Additions | − | Subtractions ] | × | [ $FTE_{OHIP}$ Conversion Factor ] |
| Variable |  |  | Base year CPSO Registration |  | Graduates + Immigrants + Re-entrants |  | Death + Emigrants + Retirements |  | Ratio of $FTE_{OHIP}$ to CPSO supply |
| Definition |  |  | Total Number of Physicians Resident in Ontario |  | Physicians Graduating from Ontario Medical Schools<br>Physican Immigrants<br>Physicians Re-entering the Labor Force |  | Physician Deaths<br>Physician Emigrants<br>Physician Retirements |  | Adjustment for OHIP-CPSO Data Compatibility |

## EXHIBIT 3

### Calculations For The Physician Efficiency Factors

**Assumes Relative Female Productivity is Constant**

| | Female Efficiency Factor | | Proportion Female | | Male Efficiency Factor | | Proportion Male | | Efficiency Factor |
|---|---|---|---|---|---|---|---|---|---|
| 1980 | 0.75[1] | * | 0.128 | + | 1.00 | * | 0.872 | = | 0.968 |
| 1991 | 0.75 | * | 0.207 | + | 1.00 | * | 0.793 | = | 0.948 |
| 2001 | 0.75 | * | 0.246 | + | 1.00 | * | 0.754 | = | 0.938 |

**Assumes Male and Female Productivity Converge**

| | Female Efficiency Factor | | Proportion Female | | Male Efficiency Factor | | Proportion Male | | Efficiency Factor |
|---|---|---|---|---|---|---|---|---|---|
| 1980 | 0.75 | * | 0.128 | + | 1.00 | * | 0.872 | = | 0.968 |
| 1991 | 0.875 | * | 0.207 | + | 1.00 | * | 0.793 | = | 0.974 |
| 2001 | 1.00 | * | 0.246 | + | 1.00 | * | 0.754 | = | 1.00 |

[1] Both the 1980 Manpower Survey of the Study Group for Family Medicine in Ontario and a recent survey conducted by the College of Family Physicians of Canada found that female physicians in Ontario average 75 percent as many hours as male physicians.

## EXHIBIT 4

### The Estimated Physician Requirements in 1991 and 2001

#### Assumes Relative Female Productivity is Constant

| | | Estimated 1981 Requirement | Female Productivity Adjustment | Population Adjustment | Age Adjustment | Hours-Worked Adjustment[1] | | Estimated Future Requirement |
|---|---|---|---|---|---|---|---|---|
| 1991 | $FTE_{REQ}$ = | 10,742 physicians | * (0.968/0.948) | * (9,230,625/8,503,700) | * (126,06/119.16) | * (2,565/2,404) | = | 13,439 |
| 2001 | $FTE_{REQ}$ = | 10,742 physicians | * (0,968/0.938) | * (9,532,935/8,503,700) | * (130.16/119.16) | * (2,565/2,243) | = | 15,529 |

#### Assumes Productivity Converges

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1991 | $FTE_{REQ}$ = | 10,742 physicians | * (0.968/0.974) | * (9,230,625/8,503,700) | * (126,06/119.16) | * (2,565/2,404) | = | 13,081 |
| 2001 | $FTE_{REQ}$ = | 10,742 physicians | * (0.968/1.000) | * (9,532,935/8,503,700) | * (130.16/119.16) | * (2,565/2,243) | = | 14,565 |

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[1] Assumes that only half of the difference between actual and optimum is eliminated by 1991.

*Data Sources:*
Female productivity adjustment factors — Exhibit 2; 1980 actual population, and 1991 and 2001 projections — Stats Canada; age adjustment factors — Table 10; actual and optimum number of hours worked — Tables 8 and 12.

## Appendix A

# Service Groupings Used by the Requirements Committee

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1. **Consultations**
    - Major / Initial
    - Other Consultations
2. **Complete Examinations**
    - Complete Examinations in Office—Initial
    - Complete Examinations in Office—Other
    - Complete Examination in Hospital
3. **Other Office Visits**
    - Partial / Minor / Subsequent Examination
    - Psychotherapy
    - Special Eye Examination
    - Well Baby Care
    - Other Office Visits
4. **Other Hospital Visits**
    - Regular—Up to 28/30 Days
    - Regular—Over 28/30 Days
    - Regular—Up to 35/42 Days
    - Regular—Over 35/42 Days

6. **Major Surgery (Cont.)**
    - Female Genital: Prolapse
    - Female Genital: Hysterectomy
    - Female Genital: Sterlilization
    - Female Genital: Other
    - Eye / Ear: Cataract
    - Eye / Ear: Other
    - Other Major Surgery
7. **Minor Surgery**
    - Incision—Abscess, etc.
    - Removal of Foreign Body
    - Excision—Benign Tumor / Cyst / Wart, etc.
    - Suture Wounds
    - Excision of Nail
    - Chalazion
    - Circumcision—Newborn
    - Myringotomy
    - Fractures
    - Other Minor Surgery
8. **Surgical Assistance**
    - Appendectomy

11. **Diagnostic Radiology**
    - Head and Heck
    - Spine and Pelvis
    - Extremities
    - Chest
    - G.I. Tract
    - G.U. Tract
    - Other Diagnostic Radiology
12. **Laboratory Services**
    - Haematology—Automated
    - Haematology—Manual
    - Haematology—Unspecified
    - Biochemistry—Automated
    - Biochemistry—Manual
    - Biochemistry—Unspecified
    - Radio-Isotopes
    - ECG, EEG and B.M.R.—Technical Component Only
    - Other Laboratory Services
13. **Other Diagnostic / Therapeutic Services**
    - Allergy Tests / Hyposensitization
    - Injection / Aspiration of Joint

- Newborn/Premature Care
- Other Visits—Per Diem or Per Visit
- Other Hospital Visits

**5. Home Visits**

- Routine
- Out-of-Hours/Emergency
- Other Home Visits

**6. Major Surgery**

- Integumentary: Mastectomy
- Integumentary: Other
- Respiratory: Sub-Mucous Resection, etc.
- Respiratory: Other
- Cardiovascular: Heart and Pericardium
- Cardiovascular: Varicose Veins
- Cardiovascular: Other
- Digestive System: Appendectomy
- Digestive System: Laparotomy
- Digestive System: Cholecystectomy
- Digestive System: Tonsillectomy —Child
- Digestive System: Tonsillectomy —Adult
- Digestive System: Inguinal/Femoral Hernia
- Digestive System: Haemorrhoidectomy
- Digestive System: Other
- Urinary/Male Genital: Prostatectomy
- Urinary/Male Genital: Vasectomy
- Urinary/Male Genital: Other

- Cholecystectomy
- Inguinal/Femoral Hernia
- Prostatectomy
- Hysterectomy
- Caesarian Section
- Other Surgical Assistance

**9. Obstetric Services**

- Confinement—Total Care
- Confinement—Other
- Caesarian Section
- Therapeutic Abortion
- Other Obstetric Services

**10. Anesthesia**

- Appendectomy
- Cholecystectomy
- Haemorrhoidectomy
- Prastatectomy
- Hysterectomy
- Tonsillectomy—Child
- Tonsillectomy—Adult
- Confinement and Caesarian Section
- Cystoscopy
- D & C
- Nerve Blocks
- Other Anesthesia

- ECG—Professional Component Included
- Cystoscopy—Diagnostic
- Sigmoidoscopy
- Other Endoscopy
- Lumar Myelogram
- Other Procedures Associated with Diagnostic Radiology (except 110)
- D & C
- Papanicolau Smear
- EEG—Professional Component Included
- Biopsies
- Other Diagnostic/Therapeutic Services
- Insertion of I.U.C.D.

**14. Miscellaneous Services**

- Detension Fees
- Other Identified
- Unidentified

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*Source:* Requirements Committee of the National Committee on Physician Manpower (1975).

## Appendix B

# Methodological Details on Estimating the Time Required to Provide OHIP-Paid Services in 1980

In Section IV we use the workload or productivity standards developed by the Requirements Committee of the National Committee on Physician Manpower (1975) to assess the adequacy of physician supply. The Requirements Committee organized physician "working parties" to represent general practice and each of 32 medical specialities. The working parties were asked to develop the best possible consensual estimates for the average service time associated with each of 13 service categories (as appropriate to each specialty).[1]

In Table B-1 we indicate the specialty-specific service time requirements as reported by the working parties of the Requirements Committee. Missing values were filled using the weighted average for each service category. On this same table, we also indicate the specialty-specific distribution of OHIP-paid services for 1979–1980 using the same service categorization scheme. Since psychotherapy is billed on an actual time basis in Ontario, we have broken it out as a separate category. For each specialty and each service (excluding laboratory services), the time requirement per service is multiplied times the number of OHIP-paid services to estimate the total time requirements for specialists providing the service. These specialty- and service-specific time requirements are then aggregated to give the total time requirement for each service as well as the aggregate time requirement for all services. The weighted average time requirement for each service is also indicated.

The general scheme for reclassifying OHIP service categories into the categories used by the Requirements Committee is presented in Table B-2. However, a multitude of additional adjustments were made on the basis of more detailed service data provided by the Data Development and Evaluation Branch of the Ontario Ministry of Health. Data problems and adjustments are discussed below with respect to each of the service categories.

1. *Consultations*. Consultations for preoperative assessment had been counted as Hospital Care by OHIP.
2. *Complete Exams*. Preoperative major assessments had been counted as Hospital Care by OHIP.
3. *Office Visits*. No problems.
4. *Hospital Visits*. Preoperative consultations and major assessments were removed from OHIP's Hospital Care category.

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[1] The kinds of services included within each of these broad categories are indicated in Appendix A. Laboratory Services are excluded.

5. *Home Visits*. In Ontario the special visit premium is billed in addition to the usual fee. In order to avoid double-counting we took the average time requirement to be the difference between that indicated by the working parties for special visits and consultations.

6. *Major Surgery*. The OHIP data source did not distinguish major and minor surgeries; the numbers of major and minor surgeries were estimated for each specialty based on the distribution found by the Requirements Committee. For example, the Requirements Committee reported 86 percent of the surgeries performed by general practice physicians in Canada are minor surgery, and we have assumed that the proportionality is the same for Ontario.

   Also, a number of diagnostic and therapeutic procedures (e.g., cytoscopy, sigmoidoscopy, and dilatation and curettage) had been counted as Surgical Procedures by OHIP.

7. *Minor Surgery*. See Major Surgery above.

8. *Surgical Assistance*. See Anesthesia below.

9. *Obstetric Service*. "Total" and "divided" obstetric care could not be distinguished from the OHIP data source. Since the Requirements Committee assumed that obstetric procedures are billed on a "total care" basis, the actual number of births in Ontario during 1980 was taken as being a more appropriate measure of the service requirement.

10. *Anesthesia*. Anesthetist and surgical assistant services are not billed on a per procedure basis as assumed by the Requirements Committee. OHIP reimburses on the combined basis of a "relative value scale" plus the actual time requirement. For example, an anesthetist would bill six units for a simple appendectomy plus an additional unit for each 15 minutes or part thereof of anesthesia time. The anesthesia service time has been estimated by the Data Development and Evaluation Branch, Ontario Ministry of Health, as being 7.08 minutes per billing unit. We rounded this figure upwards to eight minutes to take account of indirect time. In the absence of additional information, we have assumed that this conversion factor is also appropriate for surgical assistant services.

11. *Other Diagnostic/Therapeutic Services*. Various OHIP surgical and radiological services were transferred to this category. Some service frequencies were removed to avoid double counting.

12. *Miscellaneous Services*. No problems.

13. *Diagnostic Radiology*. Some OHIP services were transferred to Other Diagnostic/Therapeutic Services.

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